Illustrated Key To The Wild And Commonly Cultivated Trees Of The Northeastern United States And Adjacent Canada (1912)

J. Franklin Collins
Howard W. Preston

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ILLUSTRATED KEY TO THE WILD AND COMMONLY CULTIVATED TREES

OF THE

NORTHEASTERN UNITED STATES AND ADJACENT CANADA

BASED PRIMARILY UPON LEAF CHARACTERS

BY

J. FRANKLIN COLLINS

AND

HOWARD W. PRESTON

NEW YORK

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MAY

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PREFACE

In 1909 the authors published their "Key to New England Trees" which was then regarded as preliminary to an illustrated edition. Later it was decided to extend the geographic range of the forthcoming edition so as to include the northeastern states and adjacent Canada.

This key is intended, as was the earlier one, to serve as a guide for those who wish to become acquainted with the wild and commonly cultivated trees of the region indicated. At the same time the book remains sufficiently small to be readily carried in the pocket. For the convenience of those who wish to learn more about the trees a bibliography of some of the more important works on the trees of northeastern America will be found on page 157. The illustrations are intended to show an outline of a typical leaf of every tree of which the leaves differ sufficiently from others to be recognized in a drawing. Where the leaves of two different trees are much alike an outline of one only is usually given, and an explanatory reference is made to this under the species not illustrated, at the proper place in the key.

It must be borne in mind that no two leaves on

a tree are exactly alike and that there is often a wide range of shapes on the same tree. For this reason the leaf outline shown (which is made from a fairly typical leaf as understood by the authors) may not be quite representative of what would be called a typical leaf of that species growing under different conditions, or in a different locality.

The bark of most trees is characteristic, but in many species, unfortunately, these characters cannot be brought out as clearly as could be desired in a halftone of the size used here. A consistent attempt has been made to illustrate only certain representative types. In certain cases, however, bark illustrations of several allied species of a group or genus are given. A full series seems hardly necessary, as the key is based primarily upon leaf characters.

Technical terms, to a large extent, have been eliminated. For the explanation of such as are used see the glossary on page 149. The geographic ranges given in the key must be interpreted as general rather than precise, as no attempt has been made to indicate the exact known limits for any species. Beside each outline drawing an inch scale, reduced in size to correspond with the reduction of the leaf, is shown. In a few cases a quarter inch scale is used, but in all such cases the scale is clearly so marked. By this device it is a simple

matter to determine the approximate size of any leaf.

Throughout the key occasional reference is made to cuts which illustrate the points under consideration.

After determining the name of a tree it is an excellent plan to go over the key again and make careful note of the particular characters that were used to separate it from other trees, especially the near allies. Also dry a leaf under moderate pressure and keep it for future reference. If these suggestions are followed systematically and conscientiously most of our common trees can soon be recognized at sight. The main object of this key is merely to guide the student through the preliminary stages of this recognition. A true knowledge of trees must be derived primarily from accurate and abundant study of the *trees* themselves.

To those who have had little or no experience in determining plants by means of botanical keys the following suggestions will be helpful.

Take the key with you into the field or wood.

Look over the tree and select typical (or average) leaves and twigs before attempting to use the key. As a rule only these should be considered. In most cases these need not be detached, and they should not be when there is any suspicion that objection might be raised to such a procedure, as might be

the case with street trees, park trees, and cultivated trees in general. If fruit characters are needed for identification and no fruit can be found on the tree, search the ground directly beneath for old fruits. If any are found, they may usually be regarded as having dropped from the tree, unless the fruit is easily blown by the wind, or the ground is sloping and other trees grow higher up the slope where fruits might easily roll down.

In using the key begin with No. 1 and read the two lines preceded by this number, deciding which one of the two applies to the tree under consideration. If the leaves of our tree are more than ½ of an inch long, as most leaves are, we next pass to No. 2, as indicated by the figure 2 following this line, and read the two lines preceded by the figure 2, deciding which one of these two applies to our tree, and again passing to the number indicated after the proper line. This simple process is repeated until we reach one or more common names in full faced type. If a number is found after this name (as in No. 6) it means that the name is that of a genus including two or more species. In order to decide which species of the genus we have, we pass to the number indicated and proceed as before. To illustrate this, suppose we reach No. 6, in the key, deciding that we have a Pine, we next turn to No. 76 in order to find *which* Pine we have, by

a process exactly similar to that mentioned above. Preceding No. 76 will be found a few briefly stated characteristics of the Pine genus. A similar characterization will be found preceding all other genera which contain more than one species. Finally we arrive at a point where no number is indicated after the line chosen. The common name (or names, where a tree is known by several names in the same or in different localities) will here be found in full faced type, except in case of some of the Thorns, and the scientific name in *italics*. If more than one common name is given the first is usually preferred, the subsequent ones being either less distinctive, less common, or merely local within our range.

The names of states and authorities for scientific names are abbreviated in the usual manner. The word "cultivated" is abbreviated to "cult.", and "figure" and "figures" to "Fig." and "Figs."

Where conflicting opinions exist in regard to specific limitations and names the 7th edition of "Gray's Manual" has been followed, particularly in such groups as Thorns, Alders, Birches, etc.

The coöperation of all who use this book, in reporting errors which they discover, is desired by the authors.

The authors herewith acknowledge their indebtedness to Prof. M. L. Fernald for many valued criticisms and suggestions.

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A SYSTEMATIC LIST OF TREES GROUPED IN FAMILIES, WITH PAGE REFERENCES 161

INDEX TO TREE NAMES 171

KEY TO GENERA AND SPECIES

1. Leaves very small and scale-like, closely appressed and overlapping; less than $\frac{1}{8}$ of an inch long. (See Figs. 5, 7.)—7.
1. Leaves more than $\frac{1}{8}$ of an inch long, not closely overlapping. (See Figs. 90, 192.)—2.

2. Leaves awl-shaped (i. e., narrow and tapering from the base to a rather sharp apex); $\frac{1}{4}$ to $\frac{3}{4}$ of an inch long and $\frac{1}{16}$ to $\frac{1}{8}$ of an inch wide. (See Figs. 1, 2*a*.) Fruit a blue berry-like cone—4.
2. Leaves not awl-shaped—3.

3. Leaves needle-shaped (i. e., slender, about the same thickness throughout, and in cross-section either semi-circular, triangular, or rhombic), not conspicuously flattened. (See Figs. 63, 64.)—5.
3. Leaves flattened and distinctly narrowed at the point of attachment, with or without a distinct leaf-stalk. (See Figs. 12, 184.)—9.

4. Leaves three at a node, $\frac{1}{2}$ to $\frac{3}{4}$ of an inch long and about $\frac{1}{16}$ of an inch wide, all

alike; whitened on the real upper surface (which is commonly turned towards the ground) and green on the lower surface, spiny pointed. Rarely a small tree, generally a shrub. Central New England and southward in the mountains. **Common Juniper, *Juniperus communis* L.** The low spreading **Dwarf Juniper** (var. *depressa* Pursh), with leaves rarely ½ inch long, is the common form of this species in New England and westward. (Figs. 1, 3.)

Fig. 1. Dwarf Juniper.

4. Leaves of two forms, one form awl-shaped, two at a node, with the real upper surface whitened, as in the Common Juniper; the other (usually on older trees) consisting of short overlapping scale-like leaves arranged in four more or less distinct longitudinal rows. Southern Maine and New Hampshire southward and westward. (Figs. 2, 3, 4.)

Fig. 2. Red Cedar. a. Twig with awl-shaped leaves; b. Twig with scale-like leaves; c. Section of b.

Fig. 3. Dwarf Juniper (the low spreading growth).
Red Cedar (the conical tree of the middle ground).

Red Cedar, Savin, *Juniperus virginiana* L.

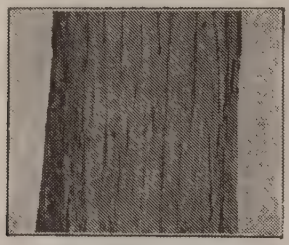


Fig. 4. Red Cedar.

5. Leaves in well marked clusters on the side of the branch—**6.**

5. Leaves not in definite clusters on the side of the branch—**Spruce, 85.**

6. Leaves five or less in a cluster—**Pine, 76.**

6. Leaves seven or more in a cluster—**Larch, 84.**

Fig. 5. Arbor Vitae. a. Side view of twig; b. Section of twig.

7. Young leafy shoots conspicuously flattened or two-edged. Northern and western New England northward and westward, also south-

ward in the mountains, and cult. (Figs. 5, 6.) **Arbor Vitae, Cedar, White Cedar,** *Thuja occidentalis* L.

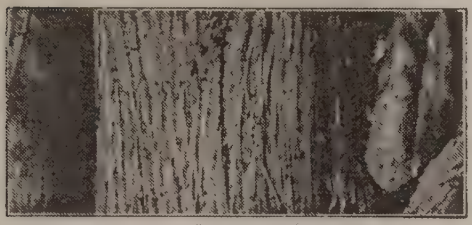


Fig. 6. Arbor Vitae.

7. Young leafy shoots not conspicuously flattened – 8.

8. Leaves of two kinds; (*a*) awl-shaped and spiny pointed and whitened above, less than ½ inch long, more common on young trees, but generally present also on some parts of older trees; (*b*) small and scale-like, smallest and youngest shoots conspicuously 4-angled. Fruit a bluish white berry-like cone about ¼ of an inch or less thick. Trees of drier situations—dry sandy fields and hillsides—rarely in low wet ground. Southern Me. and N. H. southward and westward. (Figs. 2, 3, 4.) **Red Cedar, Savin,** *Juniperus virginiana* L.

8. Leaves of one kind only; small and scale-like, some of the leaves commonly with a minute swelling or gland on the back. Smallest and youngest shoots cylindric, not conspicuously 4-angled nor flattened. Fruit a small dry brownish cone about ¼ of an inch thick, with shield-shaped scales. Trees of moist situations — swamps, bogs, etc. — rarely in dry soil. Common from N. H. to Miss. within 100 miles of the coast. (Fig. 7.) **Coast White Cedar, Cedar,** *Chamaecyparis thyoides* (L.) BSP.

Fig. 7. Coast White Cedar. a. Side view of twig; b. and c. Sections of twig.

9. Leaves less than ⅛ of an inch wide—10.
9. Leaves more than ⅛ of an inch wide—13.

10. Leaves three at a node, ½ to ¾ of an inch long and about $\frac{1}{16}$ of an inch wide, all alike; whitened on the real upper surface (which is commonly turned towards the ground) and green on the lower surface, spiny pointed. Rarely a small tree, generally a shrub. Central New England and southward in the mountains. **Common Juniper,** *Juniperus communis* L. The low spreading **Dwarf**

Juniper (var. *depressa* Pursh), with the leaves rarely ½ an inch long, is the common form of this species in New England and westward. (Figs. 1, 3.)

10. Leaves not whitened above—11.

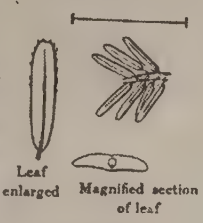


Fig. 8. Hemlock.

11. Leaves evergreen, about ½ inch long, blunt, whitened beneath, and with a distinct short slender leaf-stalk. Ontario, Quebec, New Brunswick, and southward. (Figs. 8, 9.)

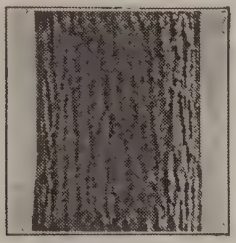


Fig. 9. Hemlock.

Hemlock, Hemlock Spruce, *Tsuga canadensis* (L.) Carr.

11. Leaves evergreen, usually at least ¾ of an inch

long, blunt, narrowed at the base, but without a distinct sharply defined leaf-stalk; often whitened beneath and sometimes more or less curved—12.

Fig. 10. Bald Cypress. a. Side view of normal shoot; b. Glyptostrobus shoot.

11. Leaves ½ to ¾ of an inch long, pointed at the apex, green or yellow-green on both surfaces,* falling from the tree in the autumn (i. e., deciduous), narrowed at the base but without a distinct leaf-stalk,† spreading along two sides of the twig. Swamps from Del. south-

Fig. 11. Bald Cypress.

* Very rarely somewhat whitened beneath.

† There is another form of this tree (or occasionally branches of a tree) with short appressed sharply pointed leaves, and slender almost pendulous branches. (Fig. 10*b*.) This is the form which formerly passed in cultivation as *Glyptostrobus pendulus* Endl.

ward and westward. (Figs. 10, 11.) **Bald Cypress,** *Taxodium distichum* (L.) Richard.

12. Mature leaves conspicuously whitened beneath. Cones upright. North-eastward from Pa. and Wis. (Figs. 12, 13.) **Balsam Fir, Balsam, Firtree, Balm of Gilead Fir,** *Abies balsamea* (L.) Mill.

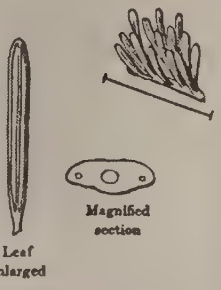


Fig. 12. Balsam Fir.

Fig. 13. Balsam Fir, showing blisters on young trunk.

12. Mature leaves not conspicuously whitened beneath. Cones hanging or pendulous, with leaf-like toothed appendages projecting beyond the scales. Cult. Native west of our range. (Fig. 14.) **Douglas Spruce, Red Fir, Douglas Fir,** *Pseudotsuga taxifolia* Britt.

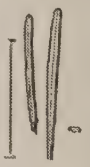


Fig. 14. Douglas Spruce; 2 leaves and a section.

13. Leaves simple, with a single blade. (See Figs. 96, 243.)—14.

13. Leaves compound, with 3 or more wholly separate blades (leaflets). (See Figs. 117, 203.)—63.

14. With 3 or more main veins of nearly equal prominence starting from the base of the blade. (See Figs. 19, 246.)—15.

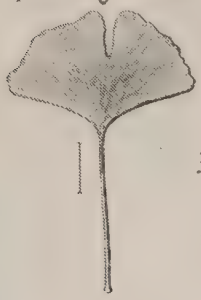


Fig. 15. Ginkgo.

14. With only one prominent vein. (See Figs. 84, 191.)—23.

14. With very many fine veins, all of equal prominence, radiating from the base of the fan-

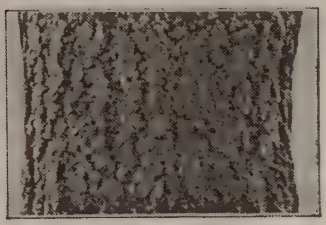


Fig. 16. Ginkgo. Old trunk.

shaped blade. Cult. Native in eastern Asia. (Figs. 15, 16, 17.) **Ginkgo, Maiden-hair Tree, *Ginkgo biloba* L.**

Fig. 17. Ginkgo. Young trunk and twigs.

15. With one leaf at a node (i. e., leaves alternate)—18.

15. With two or more leaves at a node (i. e., leaves opposite or whorled)—16.

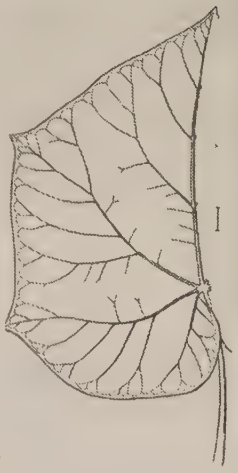


Fig. 18. Paulownia. Half of a leaf.

16. Leaf margins strongly indented in 2 or 4 places, these indentations variable, but usually reaching at least ⅓ of the distance to the base of the blade. Fruit with a flat wing—**Maple, 186.**

16. Leaves usually with only one indentation and this at the base (i. e., leaves heart-shaped), occasionally some leaves with one or two angles or shallow indentations on the sides. No small marginal teeth—17.

17. Fruit 12 to 18 inches long, cylindric—**Catalpa, 208.**

17. Fruit globular or topshaped. Cult. Native in

eastern Asia. (Fig. 18.) **Paulownia,** *Paulownia tomentosa* (Thunb.) Steud.

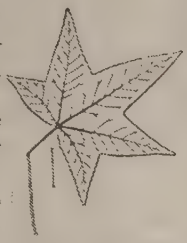


Fig. 19. Sweet Gum.

18. Prominent veins at the base of the blade 5 or more *——19.

18. Prominent veins at the base of the blade 3 * (rarely 5)——20.

19. Leaves strongly star-shaped. Conn. and southwestward, also cult. (Figs. 19, 20.) **Sweet**

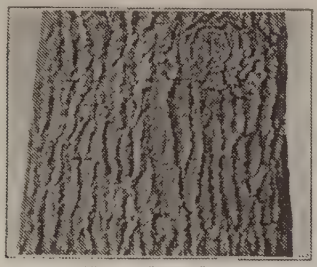


Fig. 20. Sweet Gum.

Gum, Red Gum, Alligator-wood, Liquidambar, *Liquidambar Styraciflua* L.

* In some cases the lowest veins are less prominent than the upper. At such times uncertainty may arise as to which No. 18 should be followed when trying to decide between 3 and 5 veins.

Fig. 21. Redbud.

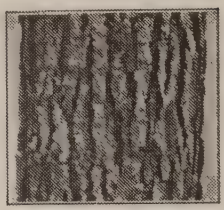


Fig. 22. Redbud.

19. Leaves symmetrically heart-shaped, margins entire. N. Y. southward and westward, also cult. (Figs. 21, 22.) **Redbud, Judas-tree,** *Cercis canadensis* L.

19. Leaves unsymmetrically heart-shaped, margins toothed—**Linden, 198.**

20. Leaves broader than long, with strong angles or shallow indentations. Southern Me. southward and westward. (Figs. 23, 24, 25.) **Buttonwood, Buttonball-tree, Plane-tree, American Sycamore, Sycamore,** *Platanus occidentalis* L.

20. Leaves longer than wide—**21.**

21. Leaf length not twice the width. Juice milky —**22.**

21. Leaf length not twice the width. Juice not milky. Base of blade unsymmetrical—**Linden, 198.**

Fig. 23. Buttonwood.

Fig. 24. Buttonwood. Young trunk.

Fig. 25. Buttonwood. Old trunk.

21. Leaf length more than twice the width. Juice not milky. Southern New England southward and westward. (Figs. 26, 27.) **Hackberry, Sugarberry, Nettle-tree, Oneberry,** *Celtis occidentalis* L.

Fig. 26. Hackberry.

22. Fruit globular, about ¾ of an inch thick. Cult. and escaped. Native in eastern Asia. (Fig. 28.) **Paper Mulberry,** *Broussonetia papyrifera* (L.) Vent.

22. Fruit longer than broad, less than ¾ inch thick —**Mulberry, 148.**

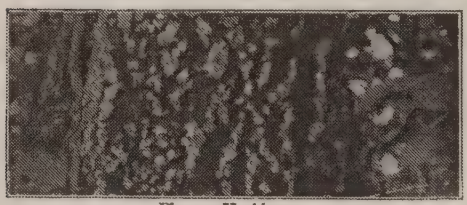


Fig. 27. Hackberry.

23. Margins either wavy, toothed, incised, or lobed. (See Figs. 46, 126, 169, 225.)—**35.**

23. Margins entire, without any of the above characters. (See Figs. 40, 150.)—**24.**

24. Twigs and bark emitting a pleasant spicy odor when bruised. Some of the leaves with a

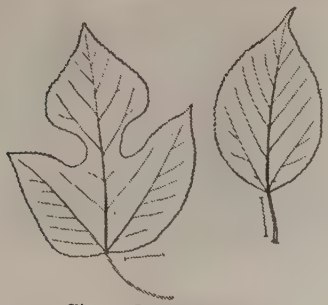


Fig. 28. Paper Mulberry.

prominent lobe on one or both sides. Leaf-stalk usually more than $\frac{3}{4}$ of an inch long. Fruit blue when ripe, about $\frac{1}{4}$ of an inch long, on a red stalk, enclosing a single seed-like stone. Central New England southward and westward. (Figs. 29, 30, 31.) **Sassafras,** *Sassafras variifolium* (Salisb.) Ktze.

Fig. 29. Sassafras.

Fig. 30. Sassafras.

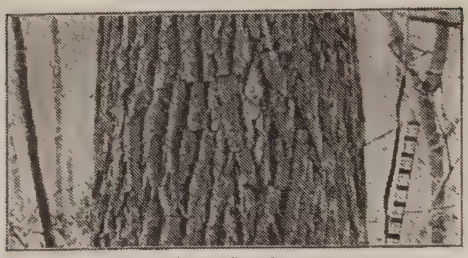


Fig. 31. Sassafras.

24. Twigs and bark emitting a disagreeable or heavy odor when bruised. Leaves without any lobes. Leaf-stalk usually less than ½ inch long. Fruit fleshy and edible, green or brown when ripe, 1½ to 5 inches long, enclosing several large seeds. Central N. Y. westward and southward. (Fig. 32.) **Papaw, Common Papaw, Custard Apple,** *Asimina triloba* Dunal.

24. Twigs and bark not particularly fragrant nor with an unpleasant odor when bruised. None of the leaves lobed—25.

Fig. 32. Common Papaw.

25. Leaves thick, smooth, and evergreen—26.

25. Leaves thin or else hairy beneath, dropping at the end of the season—27.

Fig. 33. Mountain Laurel

26. Leaves 2 to 5 inches long, green on the under surface. New Brunswick and southwestward. (Fig. 33.) **Mountain Laurel, Calico Bush, Spoonwood,** *Kalmia latifolia* L.

26. Leaves 4 to 12 inches long, with a russet, tawny, or cinnamon-colored under surface. Central New England southwestward, also locally in Nova Scotia and northern New England. (Fig. 34.) **Rhododendron, Great Laurel, Rose Bay,** *Rhododendron maximum* L.

Fig. 34. Rhododendron.

27. Side veins curving nearly to the apex of the leaf—**Cornel, 201.**

27. Side veins not curving nearly to the apex of the leaf—28.

Fig. 35. Osage Orange.

28. Branches with at least a few spines or thorns (usually many). Lower Mississippi valley, also cult. and escaped. (Figs. 35, 36.) **Osage Orange,** *Maclura pomifera* (Raf.) Schneider.

28. Branches without spines or thorns—29.

29. Leaves opposite or whorled—30.
29. Leaves alternate—31.

Fig. 36. Osage Orange.

30. Leaves mostly 3 at a node (whorled), rounded or pointed at the base. New Brunswick southwestward. (Fig. 37.) **Buttonbush,** *Cephalanthus occidentalis* L.
30. Leaves opposite, with an abrupt or slightly heart-shaped base. Cult. and escaped. Native in Eurasia. (Fig. 38.) **Lilac,** *Syringa vulgaris* L.
30. Leaves opposite, blade broadest at the middle or above. N. J. southwestward and cult. (Fig. 39.) **Fringe-tree, White Fringe,** *Chionanthus virginica* L.

31. Leaves 7 inches or more long — **Magnolia,** 149.
31. Leaves less than 7 inches long—32.

Fig. 37. Button-bush.

Fig. 38. Lilac.

Fig. 39. Fringe-tree.

Fig. 40. Persimmon.

32. Terminal bud ½ inch or more long—**Magnolia, 149.**

32. Terminal bud less than ½ of an inch long—33.

33. Leaves not twice as long as wide, under surface woolly-hairy. Cult.—**Quince, 152.**

33. Leaves not twice as long as wide, under surface smooth. Cult.—**Sumach, 182.**

33. Leaves at least twice as long as wide, apex more or less pointed—34.

34. Leaves somewhat rounded at the base, pointed at the apex. Fruit a globular berry an inch or more thick. Conn. southwestward and occasionally cult. (Figs. 40, 41.) **Persimmon, Date Plum,** *Diospyros virginiana* L.

34. Leaves more or less pointed at both ends.

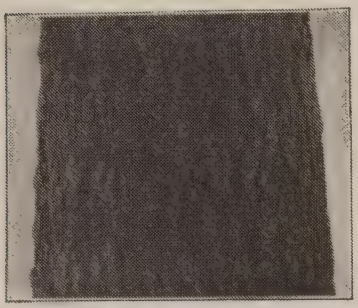


Fig. 41. Persimmon.

Fruit elongated, fleshy or juicy, less than ½ inch long, with the seed enclosed in a hard stone. Central Me. southwestward and westward. (Figs. 42, 43.) **Tupelo, Black Gum, Sour Gum, Gum,** ***Nyssa sylvatica*** Marsh.

Fig. 42. Tupelo.

Fig. 43. Tupelo.

34. Leaves pointed at both ends. Fruit an acorn (i. e., a nut with its base set in a woody cup which is composed of closely overlapping small scales)—**Oak, 126.**

35. Margin with no deep indentations (i. e., not more than ⅓ of the distance to the midrib). (See Figs. 46, 171.)—36.

Fig. 44. Tulip Tree.

35. Margin indented more than ⅓ of the distance to the midrib, often almost to the base (i. e., lobed or divided). (See Figs. 155, 208.)—38

36. Leaves abruptly cut off or indented at the broad apex. Margin with a few large angles or shallow lobes, but with no small teeth. Central New England southward and westward, also cult. (Figs. 44, 45.) **Tulip Tree,**

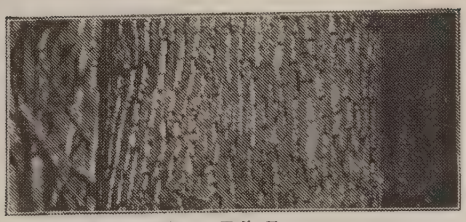


Fig. 45. Tulip Tree.

White Wood, Yellow Poplar, *Liriodendron Tulipifera* L.

36. Leaves rounded or pointed at apex. Margin wavy, with no distinct teeth nor bristle-tipped lobes, larger indentations of the margin not exceeding ⅓ of the distance to the midrib. (See Figs. 46, 171.)—**37.**

36. Leaves rounded or pointed at apex. Margin with distinct teeth or small notches, or with a few bristle-tipped lobes or angles. (See Figs. 47, 196.)—**39.**

37. Base of blade unsymmetrical. New Brunswick southwestward. (Fig. 46.) **Witch Hazel, Hamamelis,** *Hamamelis virginiana* L.

Fig. 46. Witch Hazel.

37. Base of blade nearly or quite symmetrical. Buds short, not

¼ of an inch long. Bark not smooth and gray *—**Oak, 126.**

37. Base of blade nearly or quite symmetrical. Buds ½ inch or more long, sharply pointed. Bark smooth and gray, even on old trunks * —**Beech, 122.**

38. Margin both deeply cut or indented, and toothed. (See Figs. 126, 208.)—**61.**

38. Margin deeply notched or indented, but not toothed. (See Figs. 30, 44.)—**59.**

Fig. 47. Holly.

39. Leaves thick, evergreen, with stiff and spiny teeth. Mass. southward along the coast, also cult. (Fig. 47.) **Holly, American Holly, White Holly,** *Ilex opaca* Ait.

39. Leaves thin—**40.**

40. Leaves and branches opposite, or seemingly so—**41.**

40. Leaves and branches alternate—**42.**

* The bark of the Gray Oak in eastern Maine is smooth and Beech-like. It is doubtless of this character elsewhere. The Gray Oak may readily be known (as contrasted with the Beech) by its lobed leaves, by its fruit, or by its winter bud characters.

41. Branches without thorns or spines, side veins of the blade not curving into the apex—**Arrow-wood, 209.**

41. Branches commonly with a few spines or thorns, side veins of the blade curving well up into the apex. Cult. and escaped. Native in Eurasia. (Fig. 48.) **Buckthorn,** *Rhamnus cathartica* L.

42. Branches with thorns—**43.**

42. Branches without thorns—**44.**

Fig. 48. Buckthorn.

43. Thorns on the side of leafy branches—**Thorn, 159.**

43. Thorns commonly formed by the pointed ends of branches. Fruit usually with 5 thin-walled seed compartments—**Apple, Pear** (in semi-wild state), **152.**

43. Thorns commonly formed by the pointed ends of branches. Fruit with a single seed enclosed in a hard stone—**Plum, 175.**

44. Side veins nearly straight, usually unbranched. (See Figs. 143, 146, 178.)—**45.**

44. Side veins curving or prominently forking. (See Figs. 258, 263, 275.)—**54.**

45. Leaf base very unsymmetrical, as a rule, and the margins doubly toothed. Fruit flat, with a broad wing surrounding the single seed. (See Fig. 178.)—**Elm, 144.**

45. Leaf base symmetrical, or nearly so. (See Fig. 153.)—**46.**

46. Margins with coarse teeth or angles, less than 6 per inch, or else with straight side veins, each terminating in a bristle-like tooth. (See Figs. 146, 172.)—**47.**

46. Margins with small teeth, more than 6 per inch. (See Figs. 49, 131.)—**49.**

47. Fruit a nut; one to several nuts completely enclosed in a prickly bur until mature. Each of the numerous side veins of the leaf-blade terminating in a marginal tooth—**48.**

47. Fruit a nut with its base set in a scaly cup. Leaf margins commonly with a few large angular teeth or shallow angular lobes, each tipped with a short bristle—**Oak, 126.**

48. Nut triangular in section. Bark of trunk smooth, firm, and gray—**Beech, 122.**

48. Nut not triangular in section. Bark of older trunks furrowed—**Chestnut, 125.**

49. Bark chalky white or whitish, or (if dark colored) with the outer layers of the bark separable into thin papery layers—**Birch, 111.**
49. Bark not chalky white, nor whitish—50.

50. Small twigs aromatic when bruised—**Birch, 111.**
50. Small twigs not aromatic when bruised—51.

51. Leaves taper-pointed. (See Fig. 49.)—52.
51. Leaves not taper-pointed. (See Figs. 123, 137.)—53.

Fig. 49. Hop Hornbeam.

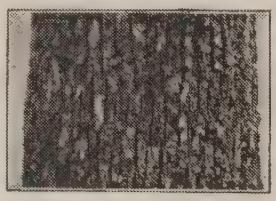


Fig. 50. Hop Hornbeam.

52. Surface of the bark brownish, with somewhat shredded flakes or scales. New Brunswick southward and westward. (Figs. 49, 50.) **Hop Hornbeam, Ironwood, Leverwood, Hornbeam, Hardhack,** *Ostrya virginiana* (Mill) K. Koch.

52. Surface of the bark close and gray, with no tendency to become furrowed or scaly, although the trunk commonly produces at least a few muscle-like or tendon-like ridges, giving it a characteristic appearance. New Brunswick southward and westward. (Figs. 51, 52.) **American Hornbeam, Blue Beech, Water Beech, Hornbeam, Ironwood,** *Carpinus caroliniana* Walt.

Fig. 51. American Hornbeam.

53. Leaves with a broadly wedge-shaped (or abrupt) and entire base, and a pointed apex. Twigs reddish. Bark of old trunks reddish or

Fig. 52. American Hornbeam.

brownish, forming scales with upturned papery margins—**Birch, 112.**

53. Leaves usually rounded at one or both ends. Bark without papery-margined scales—**Alder, 119.**

54. Blade nearly as wide as long, with an unsymmetrical and usually heart-shaped base—**Linden, 198.**

54. Blade usually longer than wide, or with the base nearly or quite symmetrical—55.

54. Blade longer than wide and with an unsymmetrical base. Fruit very flat—**Elm, 144.**

55. Fruit fleshy or juicy, commonly globular, not splitting open at maturity. Wood commonly rather heavy and hard—56.

55. Fruit neither globular, fleshy nor juicy; splitting open at maturity. Seeds with long cottony hairs. Wood soft and light. Twigs commonly brittle—58.

55. Fruit small and dry, in large loose clusters, splitting open at maturity. Seeds spindle-shaped (long pointed at each end). Wood heavy and hard. Leaves 4 or 5 inches long and an inch or more wide, pointed at both ends. Penn. southward and westward.

(Fig. 53.) **Sourwood, Sorrel-tree,** *Oxydendrum arboreum* (L.) DC.

NOTE.—The Hop Hornbeam may be sought here if the side veins of the blade are more curved than usual.

56. Fruit with a single central stone which encloses a single seed—**Cherry, Plum, Peach, 175.**

56. Fruit with the seeds in thin-walled compartments—57.

Fig. 53. Sourwood.

57. Fruit less than ½ inch thick—**Juneberry, 158.**

57. Fruit ¾ to 2 inches or more thick—**Apple, Pear, 152.**

58. Leaf-stalk less than ¼ the length of the blade, or else the width of the blade less than ½ the length of the blade*—**Willow, 91.**

58. Leaf-stalk more than ¼ the length of the blade, or else the blade nearly as wide as long*—**Poplar, 98.**

* Exceptionally narrow leaved forms of the Balsam Poplar may be distinguished, from Willows, by the strong balsamic odor of leaves and buds, and by the metallic-looking sticky lower surface of their leaves.

59. Leaves abruptly cut off or indented at the broad apex. Central New England southward and westward, also cult. (Figs. 44, 45.) **Tulip Tree, White Wood, Yellow Poplar,** ***Liriodendron Tulipifera*** **L.**

59. Leaves pointed or rounded at the apex, not indented—60.

60. Twigs bright or shining green, bark spicy aromatic when bruised. Central New England southward and westward. (Figs. 29, 30, 31.) **Sassafras,** ***Sassafras variifolium*** (Salisb.) Ktze.

60. Twigs not spicy aromatic—**Oak, 126.**

NOTE.—The Fern-leaved Beech (occasionally planted), with smooth gray bark, long pointed buds, and deeply divided leaves, may be sought here if the leaf margins are less deeply cut than usual.

61. Branches thorny. **English Hawthorn—159.**

61. Branches not thorny—62.

62. Bark whitish and papery. Cult.—**Cut-leaved Birch, 114.**

62. Bark not whitish and papery—**Oak, 126.**

NOTE.—The Fern-leaved Beech (occasionally

planted), with smooth gray bark, long pointed buds, and deeply divided leaves, may be sought here if the leaves are somewhat toothed as well as deeply cut.

63. Leaflets all attached at one point (i. e., leaves palmately compound), with no stalk to any of the leaflets. Cult.—**Horse-chestnut, Buckeye, 195.**

63. Leaflets scattered along both sides of the common axis (i. e., leaves pinnately compound); if composed of only 3 leaflets then the terminal one with a distinct individual stalk. (See Figs. 234, 237.)—64.

Fig. 54. Honey Locust. a. Once compounded leaf; b. Portion of a twice compounded leaf.

64. Leaves with an odd leaflet at the tip—67.

64. Leaves usually with a pair of leaflets at the tip—65.

65. With thorns on the branches or trunk. Central N. Y. and Penn. southwestward and westward, also cult. and escaped. (Figs. 54,

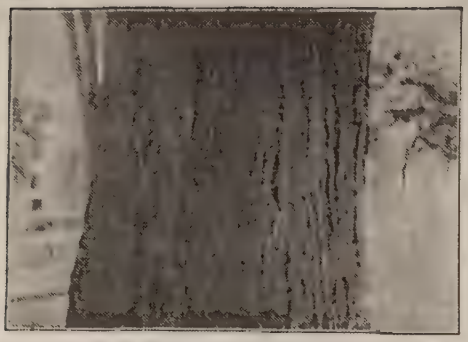


Fig. 55. Honey Locust.

Fig. 56. Honey Locust. Thorns on young trunks.

55, 56.) **Honey Locust, Three-thorned Acacia, Honey Shucks, Honey,** *Gleditsia triacanthos* L.

65. Without thorns—66.

Fig. 57. Tree of Heaven, Ailanthus. Two leaflets from a leaf made up of 31 leaflets. a. From middle of leaf. b. From base of leaf.

66. Leaves once compound. Cult. and escaped. Native of China. (Figs. 57, 58.) **Tree of Heaven, Ailanthus, Chinese Sumach,** *Ailanthus glandulosa* Desf.

Leaves twice compound, at least in part of the leaf. Central N. Y. westward and south-

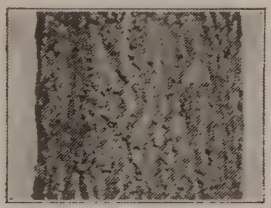


Fig. 58. Tree of Heaven, Ailanthus.

westward, also cult. (Figs. 59, 60.) **Kentucky Coffee-tree,** *Gymnocladus dioica* (L.) Koch.

Fig. 59. Kentucky Coffee-tree. Portion of a leaf.

67. Leaves only once compound. (See Figs. 234, 271.)—68.

67. Leaves twice compound, at least in part of the leaf. Central N. Y. westward and

Fig. 60. Kentucky Coffee-tree.

southwestward, also cult. (Figs. 59, 60.) **Kentucky Coffee-tree,** *Gymnocladus dioica* (L.) Koch.

68. Leaves opposite—69.
68. Leaves alternate—70.

69. Wing of the fruit unsymmetrical, thickened at one edge. Leaflets usually 3 or 5. Western New England southward and westward, also cult. and escaped—**Box Elder, Ash-leaved Maple, 186.**
69. Wing of fruit symmetrical, not thickened at one edge. Leaflets usually 7 or 9—**Ash, 202.**

70. Margins of leaflets more or less regularly toothed, at least above the middle. (See Figs. 204, 234.)—73.
70. Margins of leaflets without teeth, at least none above the middle. (See Figs. 57, 235.)—71.

71. Leaflets commonly with one or more irregular teeth or notches near the base. Fruit nearly 2 inches long, very thin, with one seed near the middle. Cult. and escaped. Native in China. (Figs. 57, 58.) **Tree of Heaven, Ailanthus, Chinese Sumach,** *Ailanthus glandulosa* Desf.
71. Leaflets without the basal teeth. Fruit flattish, usually at least 2 inches long, several seeded—72.
71. Leaflets without the basal teeth. Fruit globu-

lar, usually less than ¼ of an inch thick—**Sumach, 182.**

72. Leaflets opposite. Bark deeply furrowed—**Locust, 181.**

72. Leaflets alternate. Bark smooth and gray. Tenn. and adjoining area, also cult. (Figs. 61, 62.) **Yellow Wood,** *Cladrastis lutea* (Michx. f.) Koch.

Fig. 61.
Yellow Wood.

73. Juice milky. Pith occupying more than half the diameter of the youngest branches—**Sumach, 182.**

73. Juice not milky. Pith not occupying half the diameter of the youngest branches—74.

74. Fruit fleshy, red, globular; less than ½ inch thick; in flat-topped clusters. Leaflets commonly more than 11. Bark of trunk usually smoothish—**Mountain Ash, 157.**

74. Fruit a dry nut, ½ inch or more thick. Leaflets either less than 11, or else the bark of the trunk prominently furrowed—75.

75. Exterior husk of fruit not splitting away at maturity. Nut roughened with jagged

Fig. 62. Yellow Wood.

points or ridges. Leaflets usually 9 to 17—**Walnut, 106.**

75. Exterior husk of fruit splitting vertically into 4 parts at maturity. Nut smooth. Leaflets usually 5 to 9—**Hickory, 107.**

PINE.—Leaves needle-shaped, 2 to 5 in a cluster. Fruit a cone, composed of woody closely

Fig. 63. White Pine.

Fig. 64. Yellow Pine.

Fig. 65. Pitch Pine.

crowded and overlapping scales attached to all sides of a common (usually short) axis.

76. Leaves 5 in a cluster. Throughout our range. (Figs. 63, 67.) **White Pine, Soft Pine,** *Pinus Strobus* L.

76. Leaves commonly 3 in a cluster—77.

76. Leaves commonly 2 in a cluster—79.

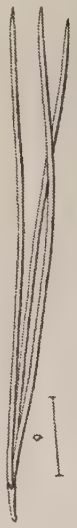


Fig. 66. Loblolly Pine. Leaf cluster and section of a leaf.

77. Leaves 1 to 3 inches long. N. J. and southwestward. (Fig. 64.) **Yellow Pine, Shortleaf Pine,** *Pinus echinata* Mill.

77. Leaves 3 to 5 inches long—78.

77. Leaves 6 to 9 inches long. Southern N. J.

southward along the coast. (Fig. 66.) **Loblolly Pine, Old-field Pine,** ***Pinus Taeda*** **L.**

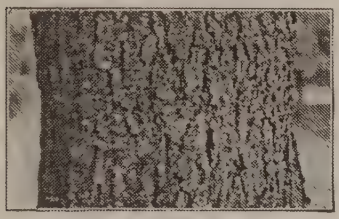


Fig. 67. White Pine.

78. Sheaths at the base of the leaf-clusters short. Cone scales with a short rigid prickle at the

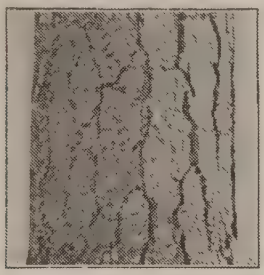


Fig. 68. Pitch Pine.

tip. New Brunswick southwestward. (Figs. 65, 68.) **Pitch Pine, Hard Pine,** ***Pinus rigida*** **Mill.**

78. Sheaths at the base of the leaf-clusters long. Cone scales with a small weak short prickle at the tip. N. J. southwestward. (Fig. 64.) **Yellow Pine, Shortleaf Pine,** *Pinus echinata* Mill.

79. Leaves 1 to 4 inches long—**60.**
79. Leaves 4 to 6 inches long—**83.**
79. Leaves 6 to 9 inches long. Southern N. J. southward along the coast. (Fig. 66.) **Loblolly Pine, Old-field Pine,** *Pinus Taeda* L.

Fig. 69. Table Mountain Pine. Leaf cluster and section of a leaf.

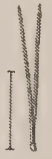


Fig. 70. Jersey Pine.

Fig. 71. Northern Scrub Pine. Leaf cluster and section of a leaf.

80. Cone scales with a small weak prickle at the tip. N. J. southwestward. **Yellow Pine, Shortleaf Pine,** *Pinus echinata* Mill.
80. Cone scales with a strong sharp prickle at the tip—**81.**
80. Cone scales usually without a prickle—**82.**

81. Tip of the cone scales with a stout hooked prickle or spine about ¼ of an inch long. Penn. southwestward along the mountains. (Fig. 69.) **Table Mountain Pine,** *Pinus pungens* Lamb.

81. Tip of the cone scales with a slender prickle barely ⅛ of an inch long. Long Island south-

Fig. 72. Northern Scrub Pine.

westward. (Fig. 70.) **Jersey Pine, Scrub Pine,** *Pinus virginiana* Mill.

82. Cones pointing forward towards the tip of the branch. Northern New England to Mich. and northward. (Figs. 71, 72.) **Northern Scrub Pine, Gray Pine, Scrub Pine,** *Pinus Banksiana* Lamb.

82. Cones pointing backward. Cult. and escaped.

Native in Eurasia. (Fig. 73.) **Scotch Pine, "Scotch Fir,"** *Pinus sylvestris* L.

Fig. 73. Scotch Pine. Leaf cluster and section of a leaf.

83. Cones about 2 inches long. Young branches somewhat orange-colored. Leaves usually shining, slender, and flexible; resin ducts varying in number and located close to the surface. New England to Penn. and northward. (Fig. 74*a*, *b*.) **Red Pine, Norway Pine,** *Pinus resinosa* Ait.

83. Cones 2½ to 3 inches long. Young branches grayish brown. Leaves usually dull and rigid; resin ducts varying in number and located in the interior of the leaf, midway between the surface and the central bundle. Leaves otherwise nearly as in Red Pine. Cult. Native in southeastern Europe.

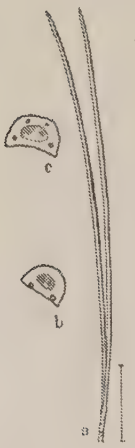


Fig. 74. Red Pine. a. Leaf cluster. b. Magnified cross-section of a leaf. The shaded portion is the central bundle and the small circles the resin ducts. c. A similar section of Austrian Pine leaf.

(Fig. 74c.) **Austrian Pine,** *Pinus Laricio* var. *austriaca* Endl.

LARCH.—Leaves many in a cluster, falling from the tree in the autumn. Fruit a cone, as in Pine.

84. Leaves 1 inch or less in length. Cones ½ to ¾ of an inch long; scales few. Central Penn. northeastward and northwestward. (Fig. 75.) **American Larch, Tamarack,**

Fig. 75. American Larch.

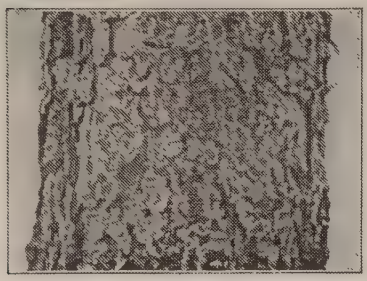


Fig. 76. European Larch.

Hackmatack, "Juniper," *Larix laricina* (Du Roi) Koch.

84. Leaves 1 inch or more in length. Cones about 1 inch long, with many scales. Cult. Native in Europe. (Fig. 76.) **European Larch,** *Larix decidua* Mill.

SPRUCE.—Leaves 4-sided or 4-angled, attached to all sides of the branch. Fruit a cone, as in Pine.

85. Young twigs hairy—86.

85. Young twigs smooth or nearly so—88.

86. Mature cones less than 3 inches long—87.

86. Mature cones more than 3 inches long. Cult. and escaped. Native in Europe. (Fig. 77.) **Norway Spruce,** *Picea Abies* (L.) Karst.

Fig. 77.
Norway Spruce.

87. Leaves ½ to ¾ of an inch long, normally all curving upwards. Cones 1½ to 2 inches long, commonly not remaining attached to the branch for more than one year; cone scales usually entire at the margin. Tree reaching 40 feet or more in height, usually with a pyramidal crown and growing on uplands, rarely in wet places. Penn. and central New England northwestward, and

in the mountains to Ga. (Figs. 78, 79.) **Red Spruce, Yellow Spruce,** *Picea rubra* (Du Roi) Dietr.

87. Leaves ¼ to ⅝ of an inch long. Cones ½ to 1½ inches long, remaining attached to the branch for many years; cone scales usually with the margin irregularly finely toothed (as if

Fig. 78. Red Spruce.

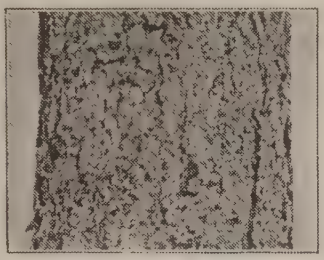


Fig. 79. Red Spruce.

gnawed). Tree of swamps or low lands, rarely on uplands, usually with a columnar crown and less than 30 feet high. Occasionally fruiting when only 3 or 4 feet high. W. Va. northeastward and northwestward. (Fig. 80.) **Black Spruce, Swamp Spruce, Bog Spruce,** *Picea mariana* (Mill.) BSP.

88. Leaves pointed, often sharply—89.

88. Leaves blunt, less than ½ inch long, thick,

dark shining green. Occasionally cult. Native in western Asia. **Oriental Spruce,** *Picea orientalis* Carr.

Magnified leaf section (diagram)

Fig. 80. Black Spruce. Showing leaf arrangement, hairy branchlet and leaf section.

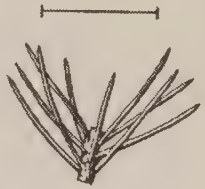


Fig. 81. Colorado Blue Spruce.

89. Foliage bluish green or silvery—90.

89. Foliage green. Cones 4 to 7 inches long. Cult. and escaped. Native in Europe. (Fig. 77.) **Norway Spruce,** *Picea Abies* (L.) Karst.

90. Cones 2½ to 4 inches long; scales distinctly longer than broad, with a ragged blunt apex. Cult. Native in the Rocky Mountains. (Fig. 81.) **Colorado Blue Spruce, Silver Spruce,** *Picea Menziesii* Engelm.

90. Cones 1½ to 2 inches long; scales rounded, not ragged. Foliage usually with an unpleasant odor. Northern New England

Fig. 82. White Spruce. Showing leaf arrangement, smooth branchlet and leaf section.

northward and westward. (Fig. 82.) **White Spruce, Single Spruce, Skunk Spruce, Cat Spruce,** *Picea canadensis* (Mill.) BSP.

WILLOW.—Leaves narrow, except in Bay-leaved Willow. Flowers in catkins. Stamens 2 to 8. Bracts not fringed. Fruit a small elongated dry pod. Seeds small, with long hairs. Many hybrids.*

91. Length of the blade not more than 3 times its width. Teeth blunt and glandular, 15 to 20

*The Glaucous Willow (*Salix discolor* Muhl.), the Shining Willow (*S. lucida* Muhl.), including also a variety of it, and the Balsam Willow (*S. balsamifera* Barratt) are generally shrubs and are not included in the key. All of these, however, may assume a tree-like habit along our northern border. See Williams in Rhodora 3: 277 (1901).

per inch of margin. Leaf-stalk with glands above. Stamens 3 to 5, or more. Cult. and escaped. Native in Eurasia. (Fig. 83.) **Bay-leaved Willow,** *Salix pentandra* L.

Fig. 83. Bay-leaved Willow.

91. Length of the blade at least 4 times its width—92.

92. Stipules usually present. No glands on the leaf-stalk. Teeth 15 to 30 per inch of margin. Stamens 3 to 5 or more—93.

92. Stipules usually not persistent. Leaf-stalk generally with glands. Normally with 2 stamens—95.

Fig. 84. Peach-leaved Willow.

93. Leaf-stalk more than $\frac{3}{8}$ of an inch long. Stipules dropping almost as soon as the leaf expands. Leaves from 3 to 5 times as long as wide, with a long slender point and small marginal teeth. Western N. Y., western Penn. westward. (Fig. 84.) **Peach-leaved Willow, Almondleaf Willow,** *Salix amygdaloides* Anders.

93. Leaf-stalks less than $\frac{3}{8}$ of an inch long. Stipules usually persisting nearly the entire season—94.

94. Leaves whitish and veiny beneath. Fruit clusters 3 to 4 inches long. Dry fruits $\frac{3}{16}$ to $\frac{1}{4}$ of an inch long, with finely granular surface. Md. and Va. southward and westward. (Fig. 85.) **Ward's Willow, *Salix Wardi*** Bebb.

94. Leaves with a green lower surface, although this is usually somewhat paler than the upper surface. Fruit clusters 1 to 3 inches long. Dry fruits $\frac{1}{8}$ to $\frac{3}{16}$ of an inch long, with a smooth surface. Throughout the northeastern states and into southern New Brunswick. (Figs. 86, 87.) **Black Willow, *Salix nigra*** Marsh.

Fig. 85. Ward's Willow. a. Small leaf. b. Large leaf.

Fig. 86. Black Willow.

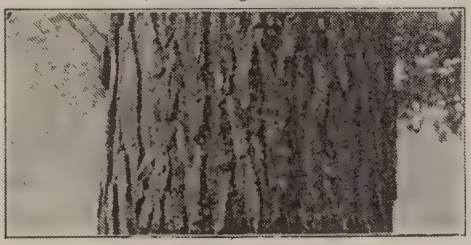


Fig. 108. Black Walnut.

95. Marginal teeth of the leaves averaging 10 to 15 per inch—96.

95. Marginal teeth of the leaves averaging 15 to 30 per inch, blunt—97.

Fig. 88. Crack Willow.

96. Length of the leaf-blade about 4 times the width. Marginal teeth blunt. Very variable. Cult. and escaped. Native in Eurasia. (Fig. 88.) **Crack Willow,** *Salix fragilis* L.

96. Length of the leaf-blade about 8 times the width; lower surface of the leaf pale. Marginal teeth sharp. Branches pendulous. Cult. and escaped. Native in the Caucasus. (Fig. 89.) **Weeping Willow, Napoleon's Willow,** *Salix babylonica* L.

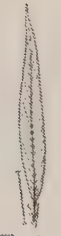


Fig. 89. Weeping Willow.

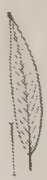


Fig. 90. White Willow.

Fig. 91. Yellow Willow.

Fig. 92. Blue Willow.

97. Mature leaves silky hairy on both surfaces. Twigs greenish. Cult. and escaped. Native in Europe. (Fig. 90.) **White Willow,** *Salix alba* L.

97. Mature leaves smooth. Twigs yellow or reddish. Cult. and escaped. (Fig. 91.) **Yellow Willow,** *Salix alba* var. *vitellina* (L.) Koch.

97. Mature leaves smooth and bluish green. Twigs olive-green. Cult. and escaped. (Fig. 92.) **Blue Willow,** *Salix alba* var. *caerulea* (Sm.) Koch.

POPLAR.—Leaves wide.* Flowers in catkins. Stamens 8 or more. Bracts fringed. Fruit essentially as in Willow.

98. Leaf margins irregularly lobed or toothed; lower surface white-cottony even when old. Cult. and escaped. Very variable. Native in Eurasia. (Figs. 93, 94.) **White Poplar, Abele, Silver Poplar,** *Populus alba* L.

Fig. 93. White Poplar.

98. Leaf margins regularly (or but slightly irregularly) toothed—99.

99. Teeth 5 or less per inch of margin. Through-

* Sometimes narrow in the American Aspen.

Fig. 94. White Poplar.

out the range. (Fig. 95.) **Large-toothed Aspen, Large-toothed Poplar, Poplar, Popple,** *Populus grandidentata* Michx.

99. Teeth 6 or more per inch of margin—**100.**

Fig. 95.
Large-toothed Aspen.

Fig. 96.
American Aspen.

100. Leaf-stalk prominently flattened in a plane at right angles to the blade—101.

100. Leaf-stalk not flattened, or but very slightly—104.

101. Blade triangular, triangularly egg-shaped, or rhombic—102.

101. Blade from broad heart-shaped or rounded to lance-shaped or oblong, usually pointed.

Fig. 97.
Lombardy Poplar.

Fig. 98.
Carolina Poplar.

Penn. northward and westward. (Fig. 96.) **American Aspen, Quaking Asp, Trembling Poplar, Tremble,** *Populus tremuloides* Michx.

102. Crown of the tree very narrow and spiry.

Branches closely ascending. Leaves commonly broader than long. Cult. and escaped. Native in Asia. (Fig. 97.) **Lombardy Poplar,** *Populus nigra* var. *italica* Du Roi.

102. Crown of the tree not spiry—**103.**

103. Young twigs smooth. Western New England

Fig. 99. Carolina Poplar.

southward and westward, also cult. (Figs. 98, 99.) **Carolina Poplar, Cottonwood, Necklace Poplar, Cotton-tree,** *Populus deltoides* Marsh.

103. Young twigs hairy. Occasionally cult. Native in Eurasia. **Black Poplar,** *Populus nigra* L.

104. Length of blade about twice the width.* Central New England westward and north-

Fig. 100. Balsam Poplar.

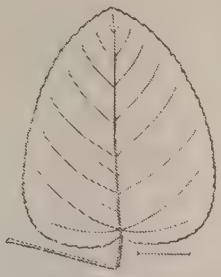


Fig. 101. Downy Poplar.

ward. (Fig. 100.) **Balsam Poplar, Tacamahac, Rough-barked Poplar,** *Populus balsamifera* L.

104. Length of blade scarcely greater than the width*—105.

* The leaves of the Balsam Poplar are sometimes wide, when they may closely resemble those of the Balm of Gilead, both of which have fragrant sticky buds. The Balm of Gilead leaf has a hairy under surface, while that of the Balsam Poplar is smooth and with a more or less metallic luster.

105. Apex of the blade blunt or rounded. Conn. southward along the coast, also in the Mis-

Fig. 102. Balm of Gilead.

sissippi valley. (Fig. 101.) **Downy Poplar, Swamp Cottonwood, River Cottonwood,** *Populus heterophylla* L.

105. Apex of the blade tapering to a very sharp point. Cult. and escaped. Probably native in Eurasia. (Fig. 102.) **Balm of Gilead, Balsam,** *Populus candicans* Ait.

WALNUT.—Leaves compound. Leaflets averaging 11 to 23. Fruit enclosed in a husk which does not split open at maturity. Nut roughened with sharp points or ridges.

Fig. 103. Butternut.

Pith of twigs appearing as if made up of a row of diaphragms when cut longitudinally.

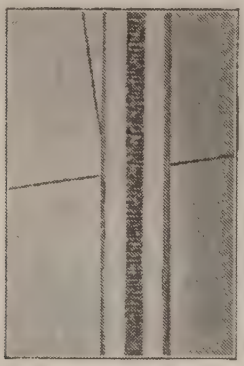


Fig. 104. Butternut. Showing pith in split twig.

106. Leaflets 11 to 17, sticky-hairy, as are also the leaf-stalks and young fruits. Fruit oblong. New Brunswick southwestward. (Figs. 103, 104, 105.) **Butternut, White Walnut, Oilnut,** *Juglans cinerea* L.

Fig. 105. Butternut.

106. Leaflets 15 to 23, not sticky. Fruit globular. Southwestern New England and central N. Y. southward and westward, also cult. (Figs. 106, 107, 108.) **Black Walnut, Walnut,** *Juglans nigra* L.

HICKORY.—Leaves compound. Leaflets 5 to 11. Fruit husk regularly splitting into 4 parts at maturity. Nut smooth.

Fig. 106. Black Walnut.

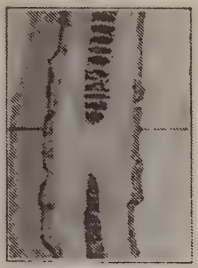


Fig. 107. Black Walnut. Showing the pith in a split twig.

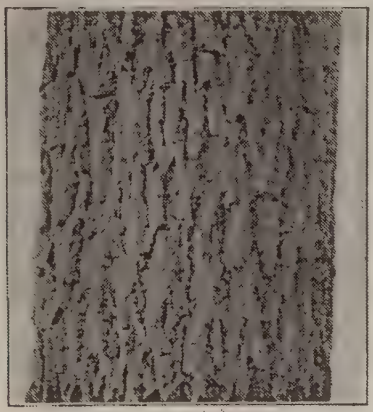


Fig. 108. Black Walnut.

107. Leaflets averaging 5 to 7—108.
107. Leaflets averaging 7 to 11—110.

Fig. 109. Shag-bark Hickory (lowest pair of leaflets usually pointing backwards).

108. Leaflets usually 5, the lowest pair much smaller. Husk of fruit more than ½ of an inch thick. Kernel of seed sweet. Bark of old trunks separating into loose plates. Central Me. to southern Quebec and southwestward. (Figs. 109, 110.) **Shag-bark Hickory, Shell-bark Hickory,** *Carya ovata* (Mill.) K. Koch.

108. Leaflets 5 or 7. Husk of fruit less than $\frac{1}{4}$ of an inch thick—109.

Fig. 110. Shag-bark Hickory.

109. Fruit oblong, an inch or more long. Kernel of seed bitter. Bark in close rough scaly ridges. Central New England, southern

Fig. 111. Pignut.

Fig. 112. Small-fruited Hickory.

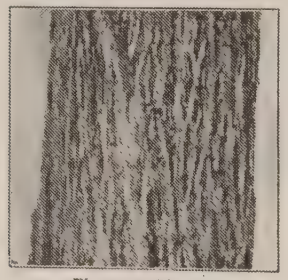


Fig. 113. Pignut.

Ontario southward and westward. (Figs. 111, 113.) **Pignut, Brown Hickory,** *Carya glabra* (Mill.) Spach.

109. Fruit globular, less than an inch in length. Kernel sweetish. Bark rough and somewhat shaggy. Central New England south-

Fig. 114. Small-fruited Hickory.

ward and westward. (Figs. 112, 114.) **Small-fruited Hickory, Small Pignut, Little Shag-bark Hickory,** *Carya microcarpa* Nutt.

110. Leaflets glandular-hairy, at least beneath, with a resinous fragrance when crushed. Fruit husk more than ½ of an inch thick. Bark hard and close, not separating into

Fig. 115. Mockernut.

Fig. 116. Mockernut.

long loose plates. Nut about 1 inch across, with a thick shell. Kernel of seed sweet. Southern New England southward and westward. (Figs. 115, 116.) **Mockernut, White-heart Hickory, Bullnut,** *Carya alba* (L.) K. Koch.

Fig. 117. Bitternut Hickory.

110. Leaflets finely hairy only when young. Fruit husk less than ⅛ of an inch thick. Bark hard and close, not separating into loose plates. Nut hardly 1 inch across, with a thin shell. Kernel of seed bitter. Southwestern Me. southward and westward. (Fig. 117.) **Bitternut, Swamp Hickory,** *Carya cordiformis* (Wang.) K. Koch.

110. Leaflets usually somewhat downy beneath. Fruit husk more than ⅛ of an inch thick. Bark of medium sized trunks forming long

Fig. 118. Big Shell-bark Hickory.

loose plates. Nut 1¼ to 2 inches across, with a thick shell. Kernel of seed sweet. Western N. Y. southwestward. (Fig. 118.) **Big Shell-bark, King Nut,** *Carya laciniosa* (Michx. f.) Loud.

BIRCH.—Leaves simple, alternate. Fruit clusters cone-like. Nuts small, winged.

111. Bark dark colored, not separable into thin papery layers. Young twigs strongly spicy-aromatic when the bark is bruised or broken. Western Me. southward and westward. (Figs. 119, 120.) **Black Birch, Cherry Birch, Sweet Birch,** *Betula lenta* L.

Fig. 119. Black Birch.

111. Bark light colored (usually white, yellowish, or pinkish), rarely dark, except in young trees;

Fig. 120. Black Birch. Old trunk.

generally separating, or separable, on medium sized trunks, into thin papery layers—**112.**

Fig. 121. Yellow Birch.

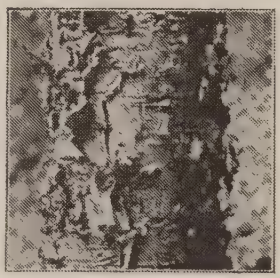


Fig. 122. Yellow Birch.

Fig. 123. River Birch.

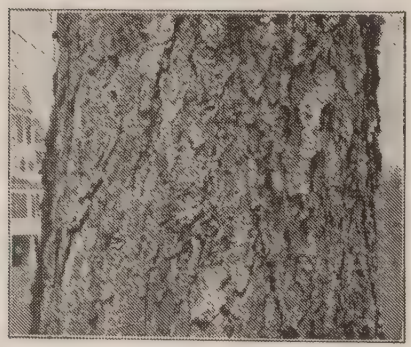


Fig. 124. River Birch. Old trunk.

112. Papery or filmy bark yellowish, silvery-gray, or straw-color, and usually shining. Bark of young twigs spicy-aromatic when bruised. Newfoundland westward and southwestward. (Figs. 121, 122.) **Yellow Birch, Silver Birch,** *Betula lutea* Michx. f.

Fig. 125. River Birch. Young trunk.

112. Papery or filmy bark varying from chalky-white or pink to bronze. Bark of young twigs not distinctly spicy-aromatic when bruised . . 113.

113. Papery bark pinkish or salmon-colored, usually separating naturally into filmy coils or

fringes on trunks and branches ranging in size from 2 to 8 inches, or more, in diameter. Leaves more or less rhombic, occasionally

Fig. 126. Cut-leaved Birch.

Fig. 127. Gray Birch.

Fig. 128.• Gray Birch.

Fig. 129. Cut-leaved Birch.

somewhat triangular, almost never of a regular egg-shaped outline. N. J. south-

ward and westward, also locally in eastern Mass. (Figs. 123, 124, 125.) **River Birch, Red Birch,** *Betula nigra* L.

113. Papery bark white or whitish, rarely as dark as bronze; in certain species not separating spontaneously into filmy coils or fringes—114.

Fig. 130. White Birch —Blue Birch.

Fig. 131. Cordate-leaved Birch.

114. Leaves deeply cut, often into narrow divisions. Cult. (Figs. 126, 129.) **Cut-leaved Birch,** *Betula pendula* var. *dalecarlica* L.

114. Leaves not deeply cut, distinctly triangular, usually with a long tapering apex. Prince Edwards Island to Md. (Figs. 127, 128.) **Gray Birch, White Birch, Poverty Birch, Old-field Birch,** *Betula populifolia* Marsh.

114. Leaves neither deeply cut nor triangular—115.

115. Young branches perfectly smooth. Northern New England, Quebec, and northwestward, (Fig. 130.) **White Birch, Blue Birch,** *Betula pendula* Roth.

115. Young branches minutely hairy—116.

Fig. 132. Cordate-leaved Birch.

116. Branches pendulous.* Cult. **Weeping Birch,** *Betula alba* var. *pendula* Hort.

116. Branches not pendulous—117.

117. Leaves rounded or slightly wedge-shaped at base—118.

* *Betula alba* var. *glutinosa* (Wallr.) Traut., with pendulous branches, is local near Mt. Katahdin and in Washington Co., Me.

117. Leaves broadly egg-shaped, heart-shaped at base. Newfoundland to northern New England and northward. (Figs. 131, 132). **Cordate-leaved Birch,** ***Betula alba*** var. ***cordifolia*** (Regel) Fernald.

Fig. 133. European Paper Birch.

Fig. 134. American Canoe Birch.

118. Leaves 1¼ to 2½ inches long. Newfoundland and northern New England and northward, also cult. (Fig. 133.) **European Paper Birch,** ***Betula alba*** L.

Fig. 135. American Canoe Birch.

118. Leaves 2½ to 3½ inches long. Newfoundland to Penn., thence westward across the

continent. (Figs. 134, 135.) **American Canoe Birch, Paper Birch, Canoe Birch, White Birch,** *Betula alba* var. *papyrifera* (Marsh.) Spach.

ALDER.—Shrubby, or occasionally small trees. Flowers in catkins. Fruit clusters cone-like.

Fig. 136. Downy Green Alder.

Fig. 137. Speckled Alder.

Fig. 138. European Black Alder.

119. Leaves broadest at the middle or below—120.
119. Leaves broadest above the middle—121.

120. Flowers in the spring. Leaves densely soft-hairy beneath. Branchlets hairy. Mature fruit ½ to ¾ of an inch long. Newfoundland to western Mass. and N. Y. (Fig. 136.) **Downy Green Alder,** *Alnus mollis* Fernald.
120. Flowers in the spring. Leaves somewhat hairy or rusty beneath, dark green above,

with impressed veins. Mature fruit ½ to ¾ of an inch long. Usually a shrub. Penn. and northward. (Fig. 137. Commonly more strongly and irregularly lobed than shown in the illustration.) **Speckled Alder, Hoary Alder,** *Alnus incana* (L.) Moench.

120. Flowers in the fall. Leaves usually broadest at the middle; and smooth on both surfaces,

Fig. 139. Smooth Alder.

Fig. 140. Fern-leaved Beech.

Fig. 141. Purple-leaved Beech.

or somewhat rusty beneath. Mature fruit ¾ to 1 inch long. Known in the eastern states only from Del. and eastern Md. **Seaside Alder,** *Alnus maritima* (Marsh.) Muhl.

121. Leaves fan-shaped or rounded. Margins coarsely toothed. Cult. and escaped. Na-

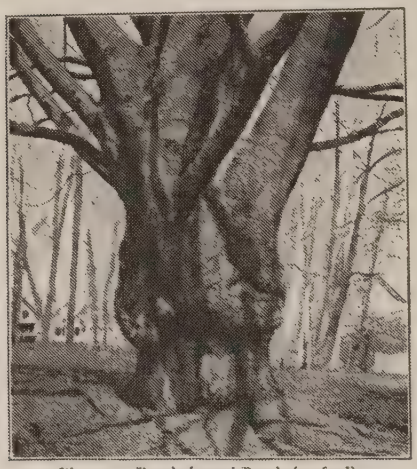


Fig. 142. Purple-leaved Beech (grafted).

tive in Eurasia and Africa. (Fig. 138.) **European Black Alder,** *Alnus vulgaris* Hill.

121. Leaves conspicuously longer than broad. Margins with very small teeth. Me. southward along the coast. (Fig. 139.) **Smooth Alder,** *Alnus rugosa* (Du Roi) Spreng.

Fig. 143. American Beech.

BEECH.—Leaves simple, alternate. Bark light gray, without furrows.

122. Leaves very variable, commonly deeply cut into slender divisions. Cult. (Fig. 140.)

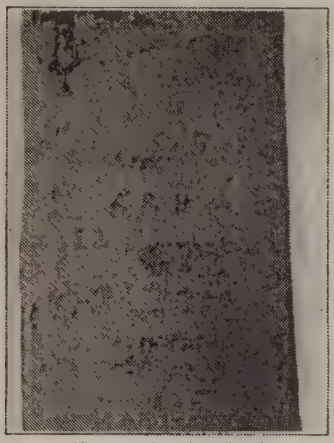


Fig. 144. American Beech.

Fern-leaved Beech, *Fagus sylvatica* var. *heterophylla* Loud.

122. Leaves not deeply cut—123.

123. Leaves purple, red, or even darker. Cult. (Figs. 141, 142.) **Purple-leaved Beech,** *Fagus sylvatica* var. *purpurea* Ait.

123. Leaves green—124.

124. With 9 to 14 pairs of side veins in the leaf, each vein ending in a distinct marginal tooth. Leaves 2½ to 5 inches long, width about half the length. New Brunswick southward and westward. (Figs. 143, 144.) **American Beech, Beech, Red Beech, White Beech,** *Fagus grandifolia* Ehrh.

NOTE.—The American Beech normally has yellowish or grayish fruit with elongated prickles. The variety *caroliniana*, from N. J. southward, has a dull red fruit and short prickles.

124. With 5 to 9 pairs of side veins, each vein ending either in or between small or blunt teeth, the latter often entirely absent and the margin merely wavy. Leaves 2 to 4 inches long, width ¾ the length. Cult. Native of Europe. (Fig. 145.) **European Beech,** *Fagus sylvatica* L.

Fig. 145. European Beech.

NOTE.—The common *Weeping Beech* is a variety of the European Beech, with drooping or pendulous branches.

CHESTNUT.—Leaves long, with a bristle tipped tooth at the end of each side vein. Fruit a bur, an inch or more thick, usually containing from 1 to 3 pointed nuts.

125. Nut usually ½ to ¾ of an inch broad, and with 2 or 3 in a bur. Leaves smooth. Southwestern Me. southward and westward. (Figs. 146, 147.) **American Chestnut, Chestnut,** *Castanea dentata* (Marsh.) Borkh.

Fig. 146. American Chestnut.

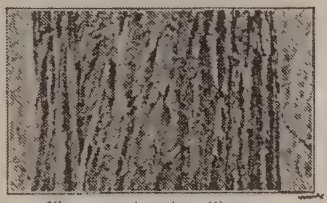


Fig. 147. American Chestnut.

125. Nut usually less than ½ inch broad, and solitary in the bur. Leaves downy-hairy beneath. Usually a shrub. N. J. southward and westward. (Fig. 148.) **Chinquapin, Dwarf Chestnut,** *Castanea pumila* (L.) Mill.

125. Nut usually more than ½ of an inch broad. Cult. (The leaves of this species are shaped

much like those of the American Chestnut, except at the variable base.) Native in Eurasia and Africa. **European Chestnut,** *Castanea sativa* Mill.

Fig. 148. Chinquapin.

NOTE.—Certain *Japanese Chestnuts* (Fig. 149) are occasionally cultivated within our range; these can usually be recognized by the very large bur, sometimes 4 or more inches in thickness, also by the small but prominently bristle-tipped teeth of the leaf margin, and the rounded or often auriculate base of the blade.

Fig. 149. Japanese Chestnut.

OAK.—Leaves simple, alternate. Fruit a nut surrounded at the base by a cup composed of closely overlapping scales; commonly known as an acorn.

126. Leaves without lobes or marginal teeth—127.
126. Leaves either lobed or toothed, or both—128.

127. Mature leaves of fruiting branches usually an inch or more wide near the middle, and about 3 times as long as broad.* Penn.

* Some leaves may occasionally be somewhat lobed.

westward and southward, also local in eastern Mass. (Figs. 150, 151.) **Laurel Oak, Shingle Oak,** *Quercus imbricaria* Michx.

127. Mature leaves of fruiting branches less than

Fig. 150. Laurel Oak.

Fig. 151. Laurel Oak.

an inch wide at the middle, and about 5 times as long as broad.* N. J. southward and westward. (Fig. 152.) **Willow Oak, Peach Oak,** *Quercus phellos* L.

127. Mature leaves of fruiting branches usually broad and rounded in the upper third, often with a tendency to become 3-lobed near the apex.* Del. southward, also in the lower Mississippi valley. (Fig. 153.) **Water Oak,** *Quercus nigra* L.

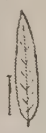


Fig. 152. Willow Oak.

*Leaves of vigorous shoots are often strongly and sharply lobed.

128. Lobes or marginal teeth ending in a bristle—129.

128. Lobes or marginal teeth not ending in a bristle—135.

Fig. 153. Water Oak. Fig. 154. Black Oak. Fig. 155. Scarlet Oak. Fig. 156. Pin Oak.

Fig. 157. Black Oak.

129. Lower surface of mature leaves smooth, or nearly so—130.

129. Lower surface of mature leaves hairy—133.

130. Acorn cup covering about half the nut—131.

130. Acorn cup shallow and broad, covering considerably less than half the nut—132.

131. Inner (or upper) thin scales of the cup finely hairy, and the tips loosely overlapping. Buds usually pointed and woolly-hairy all over, somewhat angular in cross section. Inner bark yellowish-orange and very bitter. Southern Me. southward and westward. (Figs. 154, 157.) **Black Oak, Yellow-bark Oak, Yellow Oak,** *Quercus velutina* Lam.

Fig. 158. Red Oak.

131. Inner (or upper) thin scales of the cup smooth or essentially so, and the tips very snugly overlapping. Buds usually blunt, hairy only near the tip, not usually angular in cross section. Inner bark reddish, not bitter. Southern Me. southward and westward. (Fig. 155.) **Scarlet Oak,** *Quercus coccinea* Muench.*

* See note on page 86.

132. Acorn small, less than ¾ of an inch long. Mass. southward and westward. (Fig. 156.)
Pin Oak, *Quercus palustris* Muench.

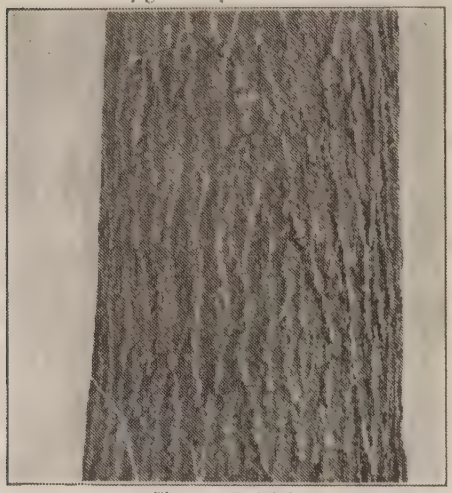


Fig. 159. Red Oak.

132. Acorn large, more than ¾ of an inch long. Throughout our range. (Figs. 158, 159.)
Red Oak, *Quercus rubra* L.*

*The Gray Oak (*Quercus rubra* var. *ambigua* (Michx. f.) Fernald), with the fruit of the Scarlet Oak and the foliage of the Red Oak, occurs along the northern range of the Red Oak and is usually regarded as a variation of that species.

133. Leaf lobes usually longer than broad and tapering more or less regularly to long sharp points. N. J. southward, also in the lower

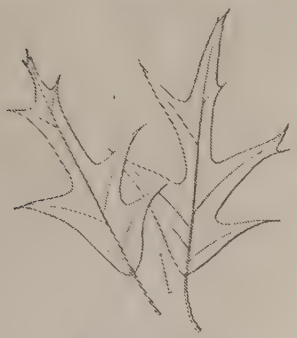


Fig. 160. Spanish Oak.

Mississippi valley. (Fig. 160.) **Spanish Oak,** *Quercus falcata* Michx.

133. Leaf lobes usually broader than long—134.

134. Blade not six times as long as the leaf-stalk. Leaves generally angularly lobed, broadest near the middle, grayish white-hairy beneath. Northeastern states. (Fig. 161.) **Scrub Oak, Bear Oak, Barren Oak,** *Quercus ilicifolia* Wang.

134. Blade more than six times as long as the leaf-

Fig. 161. Scrub Oak.

Fig. 162. Black Jack Oak (with bristles).

Fig. 163. Black Jack Oak (without bristles).

stalk. Leaves greatly broadened at the apex, usually with no pronounced lobes; lower surface rusty-hairy. Long Island southward and westward. (Figs. 162, 163.) **Black Jack Oak, Jack Oak,** *Quercus marilandica* Muench.

Fig. 164. Chestnut Oak.

135. Lower surface of the mature leaves smooth, or nearly so—136.

135. Lower surface of the mature leaves hairy—140.

136. Leaf-margins with many coarse rounded teeth which do not reach more than ¼ of the distance to the midrib—137.

136. Leaf-margins lobed—138.

137. Mature acorn cups more than 1 inch broad. — Del., Md., southward. The leaves of this species are much like those of a Chestnut Oak (See Fig. 164), but with pointed teeth. **Cow Oak, Basket Oak** (*Quercus Michauxii* Nutt.

137. Mature acorn cups less than 1 inch broad.

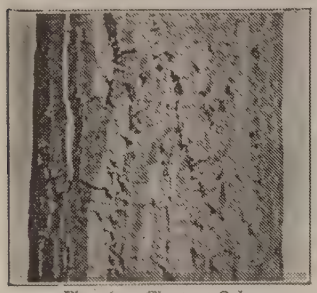


Fig. 165. Chestnut Oak.

Fig. 166. English Oak.

Southern Me. and N. H. southward. (Figs. 164, 165.) **Chestnut Oak, Rock Oak, Rock Chestnut Oak,** *Quercus Prinus* L.

138. Base of the blade pointed—139.

138. Base of the blade ear-shaped (auriculate). Cult. Native in Europe. (Figs. 166, 167.) **English Oak,** *Quercus Robur* L.

NOTE.—A less common variety of the English Oak (var. *sessiliflora*) occasionally has a tapering base to the blade, when it closely resembles the leaf of the White Oak. The tree may generally be distinguished from the latter by the rather firm prominently furrowed

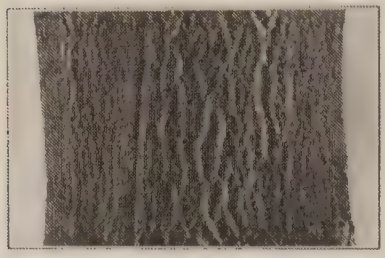


Fig. 167. English Oak.

dark bark; the bark of the White Oak being light gray with a tendency to become flaky or scaly on trunks and branches from 4 to 10 inches in diameter, rather than furrowed.

139. Acorn broader than high. Southern N. J. southward and westward. (Fig. 168.) **Overcup Oak, Swamp Post Oak, Water White Oak,** *Quercus lyratà* Walt.

139. Acorn higher than broad. Central New

England southward and westward. (Figs. 169, 170.) **White Oak,** *Quercus alba* L.

140. Deepest marginal indentations usually not reaching more than ½ of the distance to the midrib—**141.**

Fig. 168. Overcup Oak.

Fig. 169. White Oak.

140. Deepest marginal indentations usually reaching ½ of the distance to the midrib or more, at least in most of the leaves—**143.**

141. Fruit-stalk much longer than the leaf-stalk. Southern Me. southward and westward. (Fig. 171.) **Swamp White Oak, Swamp Oak,** *Quercus bicolor* Willd.

141. Fruit-stalk shorter than the leaf-stalk—**142.**

142. Leaf-margins with many coarse rounded teeth. Leaf-base tapering. Southern Me. southward and westward. (Figs. 164, 165.) **Chestnut Oak, Rock Oak, Rock Chestnut Oak,** *Quercus Prinus* L.

142. Leaf-margins with many coarse sharp teeth.

Fig. 170. White Oak.

Leaf-base tapering. Vt. and southward, mainly along the mountains. (Fig. 172. Leaves often wider than shown in the illustration.) **Yellow Oak, Chinquapin Oak, Chestnut Oak,** *Quercus Muhlenbergii* Engelm.

142. Leaf-margins with angles or lobes rather than

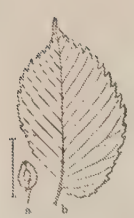


Fig. 176. American Elm. a. Fruit. b. Leaf.

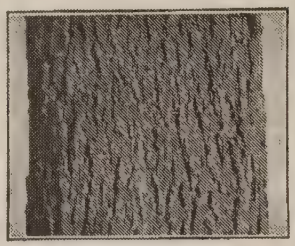


Fig. 177. American Elm.

covering more than half of the nut. Nova Scotia to Manitoba and southward to Penn. and Tenn. Rather local in New England. (Figs. 173, 174.) **Bur Oak, Mossy-cup Oak, Overcup Oak,** *Quercus macrocarpa* Michx.

143. Scales of the cup not awned. Cup usually covering less than half of the nut. Mass. southward and westward. (Fig. 175.) **Post Oak, Box White Oak,** *Quercus stellata* Wang.

Fig. 178. Cork Elm. a. Leaf. b. Fruit.

ELM.—Leaves simple, alternate, with straight side veins, doubly-toothed margins, and an unsymmetrical base. Fruit strongly

flattened, with a broad thin wing surrounding the single seed, the wing notched at the apex, and the notch usually closed above.

144. Mature fruit hairy-fringed along the margin—145.

Fig. 179. Cork Elm.

144. Mature fruit not hairy-fringed along the margin—146.

145. Mature fruit less than ½ inch long, surfaces without hairs. Side veins of the leaf usually

less than 18 pairs. Throughout our range. (Figs. 176, 177.) **American Elm, White Elm, Elm,** *Ulmus americana* L.

Fig. 180. Slippery Elm. a. Leaf. b. Fruit.

Fig. 181. Slippery Elm. Old Tree.

145. Mature fruit more than ½ inch long, slightly hairy all over. Side veins of the leaf usually

more than 18 pairs. Western New England westward and southward. (Figs. 178, 179.) **Cork Elm, Rock Elm, Northern Cork Elm,** *Ulmus racemosa* Thomas.

146. Mature fruit not hairy — 147.

146. Seed portion of the fruit hairy, elsewhere without hairs. Central New England southward and westward. (Figs. 180, 181.) **Slippery Elm, Red Elm,** *Ulmus fulva* Michx.

Fig. 182. English Elm. a. Leaf. b. Fruit.

Fig. 183. English Elm.

Fig. 184. Wych Elm.

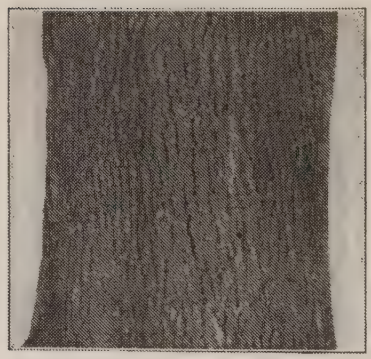


Fig. 185. Wych Elm.

147. Veins in the longer side of the leaf 11 or less. Cult. Native in Eurasia and northern Africa. (Figs. 182, 183.) **English Elm,** *Ulmus campestris* L.

147. Veins in the longer side of the leaf 12 or more. Leaves sometimes slightly lobed above. Occasionally cult. Native in Eurasia. (Figs. 184, 185.) **Wych Elm, Scotch Elm,** *Ulmus montana* With.

MULBERRY.—Leaves alternate, broad, often lobed. Fruit in general appearance suggesting a

Fig. 186. White Mulberry.

blackberry (except perhaps in color), though technically quite different.

148. Leaves smooth, usually shining. Fruit whit-

ish or pinkish. Cult. and escaped. Native in China. (Figs. 186, 187, 188.) **White Mulberry,** *Morus alba* L.

148. Leaves rough, usually downy-hairy beneath. Fruit dark purple or nearly black. Western New England southward and westward also cult. (Figs. 189, 190.) **Red Mulberry, Black Mulberry,** *Morus rubra* L.

Fig. 187. White Mulberry.

MAGNOLIA.—Leaves of many species very large. Margins without teeth. Flowers large and

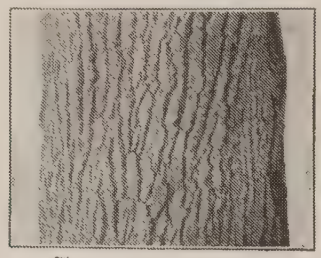
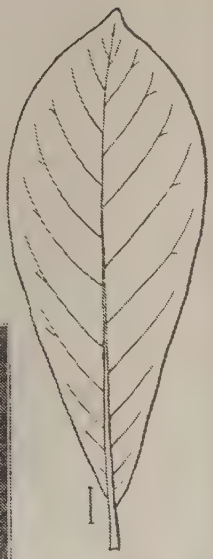


Fig. 188. White Mulberry.

conspicuous. Fruit cone-like. Seeds hanging from the mature fruit by slender threads.

Fig. 180. Red Mulberry.



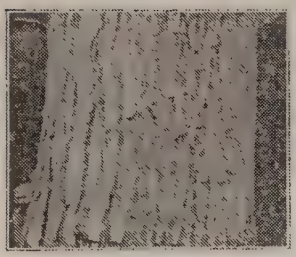


Fig. 190. Red Mulberry.

Fig. 191. Umbrella Tree.

149. Flowers appearing before the leaves in early spring. Cultivated for ornament only. Small trees or shrubs. Various **Chinese** and **Japanese Magnolias.**

149. Flowers not appearing until the leaves have expanded. Native in the eastern U. S. and cult.—150.

150. Leaves 1 to 2 feet long, pointed at both ends, crowded at the ends of the branches in umbrella-like clusters. Flowers 3 to 5 inches long. Southern Penn. southward and westward. (Fig. 191.) **Umbrella Tree,** *Magnolia tripetala* L.

150. Leaves not crowded at the ends of the branches, but scattered along the sides —151.

151. Leaves 3 to 5 inches long, blunt at the apex, whitish beneath. Flowers globular, fragrant, white, 2 inches long. Usually a shrub. N. Y. southward, also local in eastern Mass. (Fig. 192.) **Sweet Bay, Sweet Magnolia,** *Magnolia virginiana* L.

151. Leaves 6 to 10 inches long, pointed at the apex, not conspicuously whitened beneath. Flowers shaped like a narrow bell,

greenish yellow, 2 inches long. Western N. Y. southward and westward. (Fig. 193.) **Cucumber Tree,** *Magnolia acuminata* L.

151. Leaves 1 to 3 feet long, somewhat clustered, heart-shaped at the base, whitened and

Fig. 192. Sweet Bay.

Fig. 193. Cucumber Tree.

hairy beneath. Flowers broad bell-shaped, white (with purple spots at the base), about 6 inches long. Ky. southward. (Fig. 194.) **Great-leaved Magnolia, Great-leaved Umbrella Tree,** *Magnolia macrophylla* Michx.

APPLE, PEAR, QUINCE.—Leaves simple. Fruit fleshy, containing 5 thin-walled compartments with about 2 seeds in each.

152. Leaf margins toothed—153.

152. Leaf margins not toothed, lower surface woolly. Cult. (Fig. 195.) **Quince,** *Pyrus Cydonia* L.

153. Leaves woolly or velvety-hairy beneath. Fruit globular, with a depression at both ends. Cult. and occasionally growing wild. (Figs. 196, 197.) **Apple,** *Pyrus Malus* L.

153. Leaves smooth beneath, or nearly so —154.

Fig. 194. Great-leaved Magnolia.

154. Some of the leaves very irregularly toothed, or even lobed and toothed. Branches sometimes prolonged into short thorns. Fruit an inch or more long, with a depression at each end. N. J. westward and southward.

(Fig. 198.) **American Crab, Sweet Crab,** *Pyrus coronaria* L.

154. Leaves somewhat regularly toothed, not lobed—155.

Fig. 195. Quince.

155. Fruit narrower towards the base. Cult. (Figs. 199, 201.) **Pear, Common Pear,** *Pyrus communis* L.

Fig. 196. Apple.

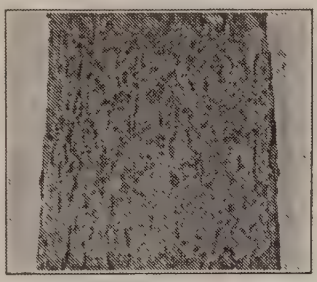


Fig. 197. Apple.

155. Fruit about an inch in diameter, not narrower towards the base—156.

156. Fruit yellow with a red cheek. Cult. and occasionally escaped in New England. Native in Asia. (Fig. 200.) **Siberian Crab,** *Pyrus baccata* L.

156. Fruit greenish. Along rivers, N. J. southward and westward. (Fig. 202.) **Narrow-**

Fig. 198. American Crab.

Fig. 199. Pear.

Fig. 200. Siberian Crab.

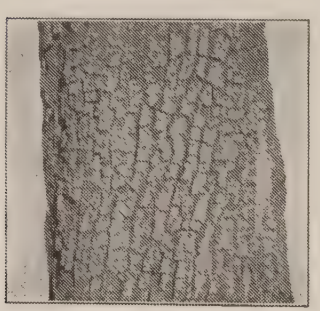


Fig. 201. Pear.

Fig. 202. Narrow-leaf Crab.

leaf Crab, Southern Crab Apple, *Pyrus angustifolia* Ait.

MOUNTAIN ASH.—Leaves compound. Fruit red, fleshy, with a core like an Apple or Pear.*

157. Fruit about ⅓ inch thick, in flat-topped clusters. Leaflets smooth, lance-shaped,

Fig. 203. American Mountain Ash.

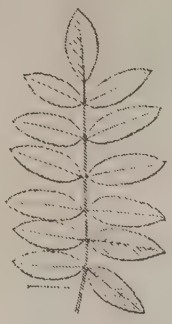


Fig. 204. Western Mountain Ash.

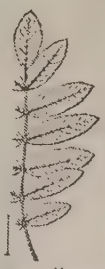


Fig. 205. European Mountain Ash.

taper-pointed. Labrador to northern New England and northwestward. (Fig. 203.) **American Mountain Ash, Round-wood,** *Pyrus americana* (Marsh.) DC.

* *Pyrus hybrida* L., with the leaves compounded (pinnately) only at the base, is a local escape in Maine.

157. Fruit about ⅓ of an inch thick, in flat-topped clusters. Leaflets smooth, oblong, abruptly pointed. Labrador through central Me. westward and northward; also cult. (Fig. 204.) **Western Mountain Ash, Elder-leaved Mountain Ash,** *Pyrus sitchensis* (Roem.) Piper.

157. Fruit about ½ inch thick, in convex clusters. Leaflets oblong, usually blunt, lower surface and leaf-stalks hairy. Cult. and escaped. Native in Eurasia. (Fig. 205.) **European Mountain Ash, Rowan Tree,** *Pyrus Aucuparia* (L.) Ehrh.

JUNEBERRY.—Fruit fleshy, rarely more than ⅜ of an inch thick, containing 10 one-seeded compartments at maturity.

158. Mature leaves smooth,* usually rounded or heart-shaped at base and pointed at

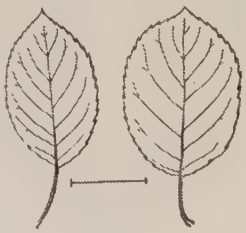


Fig. 206. Shad Bush.

*A variety of the Shad Bush (var. *tomentula* Sarg.), from southwestern Maine, southward and westward, usually has the leaves hairy when mature.

apex. Petals white, ½ inch or more long. Throughout our range. (Fig. 206.) **Shad Bush, Service Berry,** *Amelanchier canadensis* (L.) Medic.

158. Mature leaves usually rounded at both ends or with an abrupt bristle-like apex; commonly more or less hairy until old. Petals white, less than ½ inch long. New Brunswick southward and westward. (Fig. 207.) **Dwarf Juneberry,** *Amelanchier oblongifolia* (T. & G.) Roem.

Fig. 207. Dwarf Juneberry.

THORN.—Leaves simple. Fruit fleshy, globular, rarely more than ¾ of an inch thick. Seeds 1 to 5, each enclosed in a bony seed-like stone. Many species are recognized. Mostly thorny shrubs, but the following occasionally become small trees. Mature fruit is generally essential for identification.

159. Leaves deeply cut into several sparingly toothed segments. Fruit usually with one stone. Cult. and escaped. Native in Eurasia and northern Africa. (Fig. 208.) **English Hawthorn,** *Crataegus monogyna* Jacq.

159. Leaves not deeply cut, indentations reaching

less than half way to the midrib. Fruit with 2 or more stones—160.

160. Stones 2 or 3, each with 2 prominent depressions on the inner side. Leaves leathery, shining above. Nova Scotia westward and

Fig. 208. English Hawthorn.

Fig. 209. Crataegus macracantha.

southward. (Fig. 209.) *Crataegus macracantha* Lodd.

160. Stones without deep depressions on the inner side—161.

161. Flowers and fruits generally 3 to 7 in a cluster. Leaf-stalks with glands. Central New England to N. C. **Scarlet Thorn, Scarlet Haw, Red Haw, White Thorn,** *Crataegus coccinea* L.

161. Flowers generally more than 7 in a cluster—162.

Fig. 210. Cock-spur Thorn.

Fig. 211. Crataegus pruinosa.

162. Leaves broadest above the middle. Western New England southward and westward. Also cult. (Fig. 210.) **Cock-spur Thorn, Red Haw, Newcastle Thorn, Thorn Plum,** *Crataegus Crus-galli* L.

162. Leaves broadest at the middle or below—163.

163. Mature leaves smooth—164.

163. Mature leaves hairy, at least along the veins beneath—168.

164. Leaves broadest at the middle. Vt. *Crataegus Oakesiana* Eggl.

164. Leaves broadest towards the base 165.

165. Fruit firm when ripe. Leaves bluish green. Western New England southward and

westward. (Fig. 211.) *Crataegus pruinosa* (Wendl.) C. Koch.

165. Fruit soft when ripe—166.

166. Calyx lobes finely toothed. Stones usually 4 or 5—167.

166. Calyx lobes toothed. Stones usually 3 or 4. Nova Scotia to the Great Lakes and southward in the mountains. *Crataegus macrosperma* Ashe.

167. Upper surface of the mature leaves smooth. R. I. to Montreal southward and westward. *Crataegus coccinioides* var. *dilatata* (Sarg.) Eggl.

167. Upper surface of the mature leaves rough. Conn. to Del. and Ill. *Crataegus pedicillata* Sarg.

168. Leaves broadest at the middle—169.

168. Leaves broadest towards the base—170.

169. Leaves broadly egg-shaped to round. Fruit less than ½ inch thick. Stones ¼ of an inch long. Nova Scotia to Minn. and southward in the mountains. *Crataegus rotundifolia* Moench.

169. Leaves narrowly egg-shaped. Fruit more

than ½ inch thick. Stones ⅜ of an inch long. Southern Me. and up the Kennebec river. *Crataegus Jonesae* Sarg.

170. Mature leaves smooth above, or nearly so—171.

170. Mature leaves hairy or woolly, or roughened, above—173.

171. Leaves longer than broad—172.

171. Leaves about as long as broad. Western

Fig. 212. Crataegus Pringlei.

New England to Penn. and Lake Michigan. (Fig. 212.) *Crataegus Pringlei* Sarg.

172. Flower and fruit-stalks very hairy. Northern New England and N. Y. northward to the St. Lawrence. *Crataegus anomala* Sarg.

172. Flower and fruit-stalks nearly smooth. New

England southward and westward. *Crataegus Holmesiana* Ashe.

Fig. 213. Crataegus Arnoldiana.

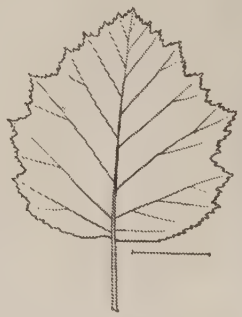


Fig. 214. Crataegus submollis.

173. Fruit pear-shaped or somewhat elongated, ripening in September and October—**174.**

173. Fruit globular, ripening in August. Local in southern New England. (Fig. 213.) *Crataegus Arnoldiana* Sarg.

174. Leaves thickish or somewhat leathery. Northwestern Vt. *Crataegus Champlainensis* Sarg.

174. Leaves thin. Southern Me. to central N. Y. and northward to the St. Lawrence. (Fig. 214.) *Crataegus submollis* Sarg.

CHERRY, PLUM, PEACH.—Leaves simple. Fruit fleshy or juicy, with a stony seed-like interior which encloses a single seed.

Fig. 215. Choke Cherry. a. Leaf. b. Four teeth enlarged.

Fig. 216. Black Cherry. a. Leaf. b. Two teeth enlarged.

175. Flower and fruit-stalks numerous, about ¼ of an inch long, arranged along the sides

Fig. 217. Black Cherry.

of a common much elongated axis. Fruit about ¼ of an inch thick—176.

175. Flower and fruit-stalks apparently arising from a common point, or else from an axis hardly longer than the long individual flower and fruit-stalks—177.

Fig. 218. Peach.

Fig. 219. Peach.

176. Marginal teeth of the leaves very sharply pointed. Newfoundland southward and westward. (Fig. 215.) **Choke Cherry,** *Prunus virginiana* L.

176. Marginal teeth of the leaves blunt, incurved, or glandular. New Brunswick southward and westward. (Figs. 216, 217.) **Black Cherry, Wild Black Cherry, Rum Cherry,** *Prunus serotina* Ehrh.

177. Flower and fruit-stalks very short, ¼ of an

inch or less. Leaves narrow. Fruit velvety-hairy, 1 inch or more thick; stone corrugated. Cult. (Figs. 218, 219.) **Peach,** *Prunus Persica* (L.) Stokes.

177. Flower and fruit-stalks conspicuous, or elon-

Fig. 220. Wild Red Cherry. (Leaves variable.)

Fig. 221. Wild Plum.

gated. Fruit smooth, stone not corrugated —178.

178. Teeth of the leaves sharply pointed. Fruit red, about ¼ of an inch thick. Labrador westward and southward to Penn. (Fig. 220.) **Wild Red Cherry, Pin Cherry, Pigeon Cherry, Bird Cherry, Fire Cherry,** *Prunus pennsylvanica* L. f.

178. Teeth of the leaves sharply pointed. Fruit reddish, ¾ to 1 inch thick. Conn. southward and westward. (Figs. 221, 222.)

Wild Plum, Yellow Plum, *Prunus americana* Marsh.

178. Teeth of the leaves blunt or glandular-tipped —179.

179. Margins of the calyx lobes finely glandular-

Fig. 222. Wild Plum.

toothed. Mature fruit smooth, orange-red or yellowish, about 1 inch long. Newfoundland to New England and westward. (Figs. 223, 224.) **Canada Plum, Red Plum, Horse Plum, Wild Plum,** *Prunus nigra* Ait.

179. Margins of the calyx lobes entire or nearly so—180.

Fig. 223.
Canada Plum.

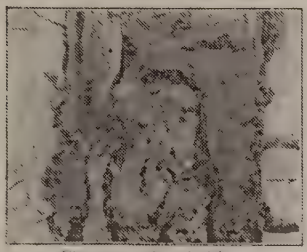


Fig. 224. Canada Plum.

Fig. 225.
Sweet Cherry.

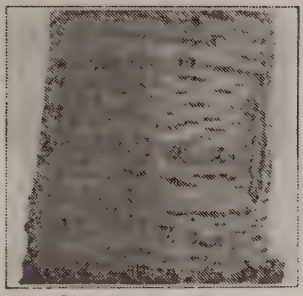


Fig. 226. Sweet Cherry.

180. Flower-producing buds developing both flowers and leaves. Inner scales at the base of the flower-stalks longer than the outer, spreading. Fruit sweet. Cult. and escaped. (Figs. 225, 226.) **Sweet Cherry,** *Prunus Avium* L.

180. Flower-producing buds developing only flowers. Inner scales at the base of the flower-stalks about like the outer, not spreading. Fruit acid, red. Cult. and escaped. (Fig. 227.) **Sour Cherry,** *Prunus Cerasus* L.

Fig. 227. Sour Cherry.

Locust.—Leaves pinnately compound. Fruit flat, similar to a bean or pea pod, with 2 or more seeds.

181. Young twigs sticky. Va. southward, also cult. and escaped. (Fig. 228.) **Clammy Locust, Rose Acacia,** *Robinia viscosa* Vent.

181. Young twigs not sticky. Penn. and along the mountains to Ga., also cult. and escaped. (Figs. 229, 230.) **Common Locust, Black Locust, Yellow Locust, White Locust,** *Robinia Pseudo-Acacia* L.

SUMACH.—Leaves alternate, pinnately compound (except in the Smoke Tree). Juice sticky as it dries, commonly milky-white when fresh. Fruit globular, less than ¼ of an

Fig. 228. Clammy Locust.

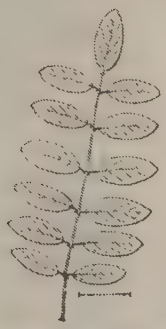


Fig. 229. Common Locust.

inch thick. Usually shrubs, the following occasionally small trees.

182. Leaves simple. Cult. Native in Eurasia. (Fig. 231.) **Smoke Tree, Venetian Sumach,** *Rhus Cotinus* L.

182. Leaves compound—183.

183. Leaflets toothed—184.

183. Leaflets not toothed—185.

184. Young twigs velvety-hairy. Fruit red. Throughout our range. (Fig. 232. Leaf outline essentially the same as in Fig. 234.) **Staghorn Sumach,** *Rhus typhina* L.

184. Young twigs not hairy. Fruit red. Central Me. southward and westward. (Fig. 234.) **Smooth Sumach,** *Rhus glabra* L.

185. Leaf axis between the leaflets prominently winged. Fruit red. Usually a shrub.

Fig. 230. Common Locust.

Fig. 231. Smoke Tree.

Southern Me. southward and westward. (Fig. 233.) **Dwarf Sumach,** *Rhus copallina* L.

185. Leaf axis between the leaflets not winged. Fruit whitish or grayish. Very poisonous. Usually growing in swamps. Southwestern Me. southward and westward. (Fig. 235.) **Poison Sumach, Poison Elder, Poison Dog-**

wood, Dogwood, Swamp Sumach, Poison Ash, *Rhus Vernix* L.

NOTE.—Many persons are poisoned by merely handling the Poison Sumach. The poisonous principle is of an oily nature and is found in every part of the plant. A good

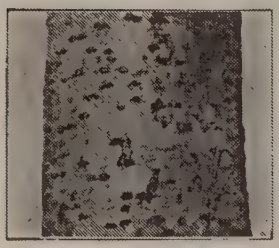


Fig. 232. Staghorn Sumach.

Fig. 233. Dwarf Sumach.

preventive against severe poisoning is to wash the parts of the body that have come in contact with the plant with strong alcohol (or strong soap suds) immediately after such contact; the sooner this is done the more effective will be the remedy. The **Poison Ivy** or **Poison Oak** (*Rhus Toxicodendron* L.) climbs by means of numerous dark brown roots, or trails over the ground

Fig. 234. Smooth Sumach.

Fig. 235. Poison Sumach.

Fig. 236. Norway Maple.

Fig. 237. Box Elder.

and fences, never becoming a tree. It is a near relative of the Poison Sumach and like that plant poisons many persons who handle it. It may be recognized by its compound leaves of three leaflets, the ter-

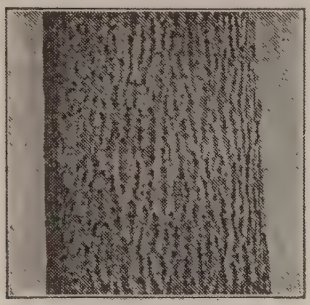


Fig. 238. Norway Maple.

minal one stalked, the margins with a few large teeth or none, and the milky juice. Flowers, fruits, poisonous properties, and remedies as in the Poison Sumach. Few persons are ever poisoned, even slightly, by handling any other than these two plants.

MAPLE.—Leaves opposite, palmately veined when simple. Fruit with a long unsymmetrical flat wing.

186. Leaves simple—187.

186. Leaves compound. Western New England southward and westward, also cult. and escaped. (Fig. 237.) **Box Elder, Ash-leaved Maple,** *Acer Negundo* L.

187. Juice milky. Cult. Native in Eurasia. (Figs. 236, 238.) **Norway Maple,** *Acer platanoides* L.

187. Juice not milky—188.

188. Flower (or fruit) stalks arranged along a common much elongated axis—189.

188. Flower (or fruit) stalks apparently arising from a common point—191.

189. Flower (or fruit) clusters erect or nodding, but not pendulous. Newfoundland to northern New England and westward; southward in the mountains. (Fig. 239.) **Mountain Maple,** *Acer spicatum* Lam.

Fig. 239. Mountain Maple. (Leaves often longer.)

189. Flower (or fruit) clusters drooping or pendulous—190.

190. Bark of small branches light green, striped with either whitish or dark lines. Leaves smooth, usually with 3 shallow taper-pointed lobes. New Brunswick westward

Fig. 240. Striped Maple.

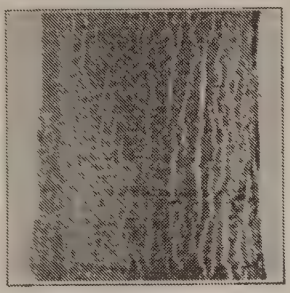


Fig. 241. Striped Maple.

and southward in the mountains. (Figs. 240, 241.) **Striped Maple, Moosewood, Striped Dogwood,** *Acer pensylvanicum* L.

190. Bark of small branches not striped. Leaves usually 5-lobed and downy-hairy beneath. Cult. and escaped. Native in Eurasia. (Figs. 242, 244.) **Sycamore Maple, European Sycamore,** *Acer Pseudo-Platanus* L.

191. Flowers in rather close clusters, not drooping, appearing before the leaves in early spring . 192.

191. Flowers in drooping clusters on long slender hairy stalks—194.

Fig. 242. Sycamore Maple.

Fig. 243. White Maple.

Fig. 244. Sycamore Maple.

192. Leaves deeply 5-lobed. Petals none. Nearly throughout our range. (Figs. 243, 245.) **White Maple, Silver Maple, Soft Maple,** *Acer saccharinum* L.

192. Leaves not cut half way to the base. Petals present—193.

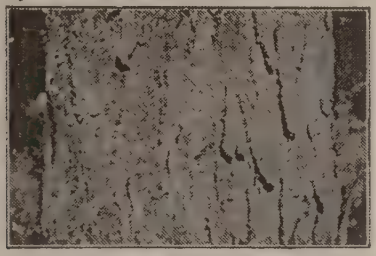


Fig. 245. White Maple.

193. Leaves 3 to 6 inches long, middle lobe oblong at base. Bark and leaves quite variable.

Fig. 246. Red Maple.

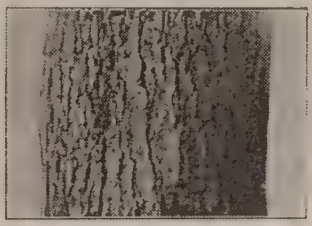


Fig. 247. Red Maple.

Nearly throughout our range. (Figs. 246, 247.) **Red Maple, Swamp Maple, Soft Maple,** *Acer rubrum* L.

193. Leaves 2 to 4 inches long, middle lobe broadly triangular. Merely a form of the Red Maple. New Brunswick and Mass., and local southward and westward. (Fig. 248.) **Three-Toothed Red Maple,** *Acer rubrum* var. *tridens* Wood.

Fig. 248. Three-toothed Red Maple.

Fig. 249. Rock Maple. From infertile branch.

194. Lower surface of the leaf pale and smoothish. Leaves of infertile trees (Fig. 249) differ from those of the fertile or fruiting trees. (Fig. 251.) Throughout our range. (Figs. 249, 251, 250.) **Rock Maple, Sugar Maple, Hard Maple, Sugar-tree,** *Acer saccharum* Marsh.

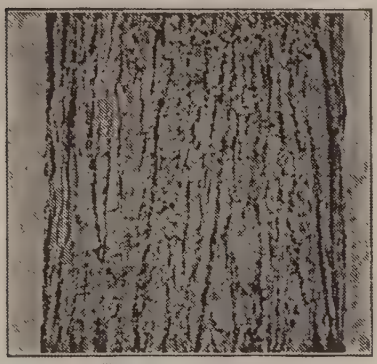


Fig. 250. Rock Maple.

Fig. 251. Rock Maple.
From fruiting branch.

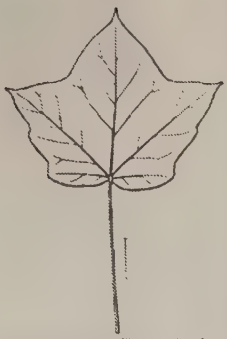


Fig. 252. Black Rock Maple.

194. Lower surface of the leaf green and hairy. A form of the Rock Maple. Western New England southward and westward. (Fig. 252.) **Black Rock Maple,** *Acer saccharum* var. *nigrum* (Michx. f.) Britton.

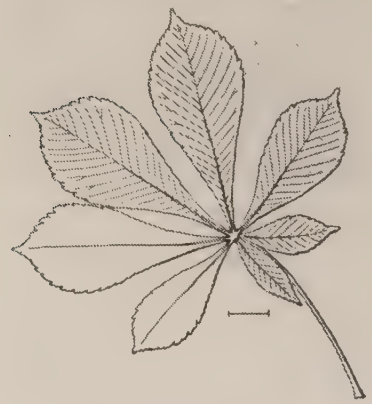


Fig. 253. Horse-Chestnut.

HORSE-CHESTNUT, BUCKEYE. — Leaves opposite, palmately compound. Several species of Buckeye from farther west are occasionally planted; these all differ from the common Horse-chestnut in having 4 petals instead of 5.

195. Fruit prickly—196.

195. Fruit smooth. Petals 4—197.

196. Petals 5, white, spreading. Leaflets usually 7. Cult. Native of southeastern Europe and Asia. (Figs. 253, 254.) **Horse-chestnut, Common Horse-chestnut,** *Aesculus Hippocastanum* L.

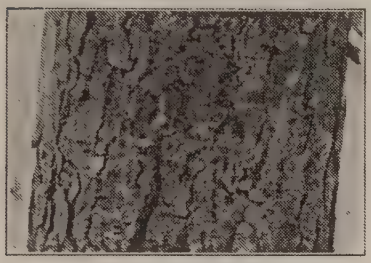


Fig. 254. Horse-Chestnut.

196. Petals 4, yellow, erect. Leaflets usually 5. Margins toothed, with tufts of hairs in the notches. Central Penn. southward and southwestward, also cult. (Fig. 255.) **Fetid Buckeye, Ohio Buckeye,** *Aesculus glabra* Willd.

197. Petals yellow. Western Penn. southward and

southwestward, also cult. (Fig. 256.) **Sweet Buckeye, Yellow Buckeye,** *Aesculus octandra* Marsh.

197. Petals and calyx red or purple. W. Va. southward and westward, also cult. **Purple**

Fig. 255. Fetid Buckeye.

Fig. 256. Sweet Buckeye.

Buckeye, *Aesculus octandra* var. *hybrida.* (DC.) Sarg.

197. Petals and calyx bright red. Usually a shrub. Va. southward and westward, also cult. (Fig. 257.) **Red Buckeye,** *Aesculus Pavia* L.

LINDEN, BASSWOOD.—Leaves broad or round egg-shaped and usually with an unsymmetrical base. Flower and fruit clusters long-stalked, attached near the middle of a large

elongated leaf-like bract. Fruit globular, woody, less than ½ inch thick.

198. Stamens attached to a petal-like body situated in front of the real petal—199.

198. Stamens not attached to a petal-like body.

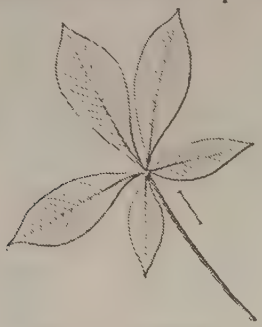


Fig. 257. Red Buckeye.

Commonly planted as a street tree in many cities. Native in Europe. (Fig. 258.) **European Linden, Lime-tree,** *Tilia vulgaris* Hayne.

199. Fruit ribbed. Leaves white-downy beneath. Cult. Native in eastern Europe. **Silver Linden,** *Tilia tomentosa* Muench.

199. Fruit not ribbed. Native in United States—200.

200. Mature leaves smooth, or essentially so, on both surfaces. Throughout our range. (Figs. 259, 260.) **American Basswood, American Linden, Basswood, Linn, Beetree, Wickup,** *Tilia americana* L.

200. Mature leaves beneath, and the twigs, red-

Fig. 258. European Linden.

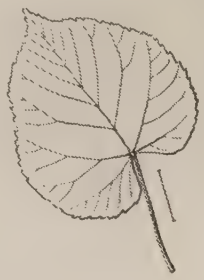


Fig. 259. American Basswood.

dish hairy. Leaves 2 to 3 inches long. Conn. westward and southward. (Fig. 261.) **Southern Basswood,** *Tilia Michauxii* Nutt.

200. Mature leaves 4 to 8 inches long, silvery-white and woolly beneath. Central N. Y. and southward along the mountains, and westward. (Fig. 262.) **White Basswood,** *Tilia heterophylla* Vent.

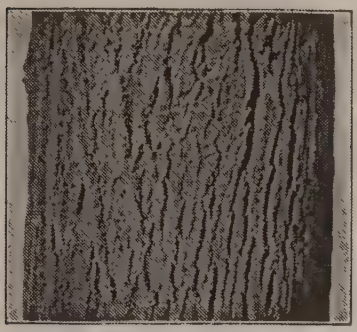


Fig. 260. American Basswood.

Fig. 261. Southern Basswood.

Fig. 262. White Basswood.

CORNEL, DOGWOOD.—Leaves simple, with veins curving well up towards the apex. Flowers 4-parted. Fruit pulpy, globular, containing a single 2-seeded, 2-celled stone. The

Fig. 263. Flowering Dogwood.

Fig. 264. Flowering Dogwood.

Poison Dogwood is a Sumach, and does not belong here.

201. Leaves opposite. The small close cluster of greenish flowers surrounded in such a way, by 4 large conspicuous white petal-like bracts, as to make the whole cluster appear like a single flower 2 or 3 inches across.

Fruit oblong, red, about ½ inch long. Central New England southward and westward. (Figs. 263, 264.) **Flowering Dogwood, Boxwood, Dogwood, Flowering Cornel,** *Cornus florida* L.

201. Leaves alternate. Flowers in large loose clusters (3 or more inches across), with no petal-like bracts. Fruit globular, blue, usually less than ½ inch thick. New Brunswick westward and southward. (Fig. 265.) **Alternate-leaved Cornel, Blue Dogwood, Green Osier, Dogwood,** *Cornus alternifolia* L. f.

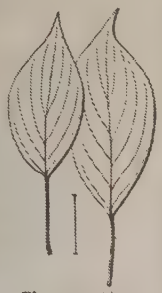


Fig. 265. Alternate-leaved Cornel.

Ash.—Leaves opposite, pinnately compound. Fruit with a long symmetrical flat wing.

202. Side leaflets without individual stalks —203.

202. Side leaflets with short individual stalks —204.

203. Leaflets green on both surfaces but somewhat darker above. Leaf axis (rhachis) usually with thick reddish-brown wool at the base of each leaflet. Crushed leaves with the

odor of Elder. A small tree growing in cold swamps or wet places. In swamps and along river banks from Newfoundland to the Great Lakes; also southward, mainly

Fig. 266. Black Ash.

Fig. 267. Red Ash.

in the mountains. (Fig. 266.) **Black Ash, Hoop Ash, Basket Ash, Brown Ash, Swamp Ash,** *Fraxinus nigra* Marsh.

203. Leaflets green above, pale beneath. Leaf axis (rhachis) usually without reddish wool. Cult. Native in Eurasia. (Fig. 268.) **European Ash,** *Fraxinus excelsior* L.

204. Young twigs and leaf-stalks hairy—205.
204. Young twigs smooth—206.

205. Fruit 1 to 2 inches long; seed-bearing portion nearly half as long as the whole fruit, and

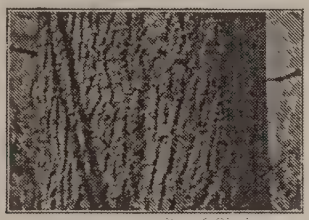


Fig. 268. European Ash.

less than $\frac{1}{4}$ of an inch thick. Calyx very small. New Brunswick westward and southwestward. (Figs. 267, 269.) **Red Ash, Brown Ash, River Ash, Bastard Ash,** *Fraxinus pennsylvanica* Marsh.

205. Fruit about $1\frac{1}{2}$ inches long; seed-bearing portion about a third as long as the fruit, and more than $\frac{1}{4}$ of an inch thick. Calyx very small. Penn. southwestward. **Biltmore Ash,** *Fraxinus Biltmoreana* Beadle.

205. Fruit 2 to 3 inches long; seed-bearing portion about quarter as long as the fruit. Calyx

prominent. Wing of the fruit running more than half way down both sides of the seed-

Fig. 269. Red Ash.

bearing portion. Western N. Y. to Mo. and southward. **Pumpkin Ash,** ***Fraxinus profunda*** Bush.

Fig. 270. Blue Ash.

206. Branchlets 4-sided. Wing of the fruit extending around the seed-bearing portion. Ohio

Fig. 271. White Ash.

Fig. 272. Green Ash.

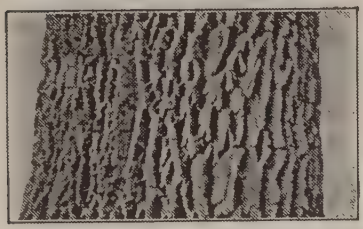


Fig. 273. White Ash.

westward and southward. (Fig. 270.) **Blue Ash,** *Fraxinus quadrangulata* Michx.

206. Branchlets not 4-sided. Wing of fruit not extending around the seed-bearing portion —207.

207. Lower surface of the leaflets paler than the upper and occasionally hairy. Throughout our range. (Figs. 271, 273.) **White Ash,** *Fraxinus americana* L.

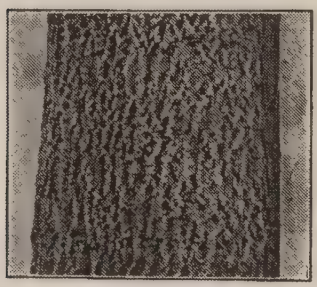


Fig. 274. Green Ash.

207. Lower surface of the leaflets bright green and smooth. Central New England southward and westward. (Figs. 272, 274.) **Green Ash,** *Fraxinus pennsylvanica* var. *lanceolata* (Borkh.) Sarg.

CATALPA.—Leaves broad, egg-shaped or heart-

shaped. Flowers white. Fruit a cylindric pod, generally a foot or more long.

208. Flowers usually at least 2 inches broad, not prominently spotted. Bark thick and rough.

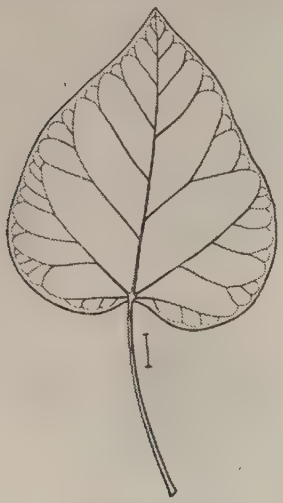


Fig. 275. Hardy Catalpa.

Upper Mississippi valley and extensively cult. (Figs. 275, 276.) **Hardy Catalpa, Cigar Tree, Western Catalpa, Indian Bean,** *Catalpa speciosa* Warder.

208. Flowers usually less than 2 inches broad, thickly spotted with yellow and purple.

Fig. 276. Hardy Catalpa.

Fig. 277. Common Catalpa.

Fig. 278. Sweet Viburnum. a. Leaf. b. Magnified margin.

Bark thin and usually not rough on medium sized trunks. Lower Mississippi valley and

extensively cult. Leaves similar in outline to those of the Hardy Catalpa. (Fig. 277.) **Common Catalpa, Indian Bean, Bean Tree, Cigar Tree, Smoking Bean,** *Catalpa bignonioides* Walt.

ARROW-WOOD.—Leaves simple, opposite, toothed. Fruit small and pulpy, containing a single stony seed. Most species are shrubs, but two are occasionally small trees.

209. Leaves with a prominent tapering point at the apex. Western New Brunswick westward and southward. (Fig. 278.) **Sweet Viburnum, Sheepberry, Nannyberry, Nanny Plum, Wild Raisin,** *Viburnum Lentago* L.

209. Leaves without a tapering point at the apex. Southwestern New England westward and southwestward. (Fig. 279.) **Black Haw, Nannyberry,** *Viburnum prunifolium* L.

Fig. 279. Black Haw.

GLOSSARY

With references to illustrative cuts

Acute. An angle less than a right angle, as in the apex of the leaf in Fig. 218.

Alternate. With one leaf at a node.

Angled. With more or less conspicuous angles or corners, as in Fig. 18.

Apex. That portion of an organ (e. g., a leaf) opposite the base, as the pointed end of Fig. 102.

Auriculate. With two basal lobes somewhat like the lower part of the human ear, as in Fig. 166.

Awl-shaped (leaf). Slender and slightly tapering from the base to a sharp apex, the broadest part of the leaf being at or near the base, as in Figs. 1, *2a*.

Awn. A long stiff hair or hair-like point, as at the apex of Fig. 155.

Base. That portion of an organ lying next to its stalk or to its supporting structure.

Berry. A juicy or fleshy fruit in which the seeds are not enclosed in definite compartments.

Blade. The flattened portion of the ordinary leaf.

Blunt. An angle greater than a right angle, as the apex of Fig. 21.

Bract. A modified leaf in a flower or a fruit cluster.

Branchlet. A small (young) branch.

Bristle. A stiff hair-like structure; nearly the same as an awn.

Bud. A rudimentary branch, usually covered with overlapping scales. A bud may produce leaves only (leaf bud), flowers only (flower bud), or both leaves and flowers (mixed bud).

Calyx. The outer (usually green) part of a flower.

Catkin. An elongated scaly cluster of flowers, as in Willows, Poplars, etc., which usually falls from the tree after flowering or fruiting.

Compound (leaf). Composed of two or more blades (leaflets), as in Figs. 54, 117.

Cone. The characteristic fruit of the Pine Family. It consists of many usually woody and closely crowded overlapping scales attached to a common axis. The seeds are borne on the upper sides of the scales.

Crown (of a tree). The general mass of branches and leaves.

Cylindric. An elongated structure (as a stem, or twig) which is circular in cross-section; i. e., not angled.

Divided. Cut almost to the center or base into nearly separate segments or divisions.

Doubly-toothed. With small teeth along the margins of larger teeth, as in Fig. 180.

Egg-shaped (leaf). Shaped like an egg; width about $\frac{2}{3}$ the length and the broadest part below the middle, as in Fig. 134.

Entire. Margins without teeth of any sort, as in Fig. 21.

Escape. A name applied to a plant originally cultivated but now growing like a wild plant.

Evergreen. With green leaves in winter as well as in summer.

Fan-shaped. Shaped like a fan or the sector of a circle, as in Figs. 15, 138.

Fleshy. Of the general consistency of a ripe apple or pear.

Forking. Splitting into two nearly equal structures, as branches or veins, as in many of the side veins in Fig. 180.

Fruit. That part of the plant which produces or contains the seeds, together with other attached parts.

Furrowed. With longitudinal grooves alternating with ridges, as in Fig. 273.

Gland. A name commonly applied to a small protuberance.

Glaucous. Covered with a bluish or whitish minute powder which is readily removed by the fingers.

Heart-shaped (leaf). A broad leaf indented (often deeply) at the base, while the apex is commonly pointed, as in Fig. 102. Also applied to the base only.

Husk. An outer covering, usually somewhat woody or fibrous. Commonly restricted to fruits.

Incised. With deeply and sharply cut notches, as in Figs. 126, 140.

Internode. The portion of the stem between two nodes.

Juicy. Containing much watery sap or juice (e. g., an orange or a cherry).

Lance-shaped. Very narrowly egg-shaped, with the length two or three times the width, as in Fig. 37.

Lateral bud. A bud situated on the side of a branch.

Leaflet. A separate blade of a compound leaf. Fig. 118 is a pinnately once compound leaf with 7 leaflets.

Leaf-stalk. The well-marked slender support of a leaf-blade, as the short stem-like portion at the base of Fig. 121. The leaf-stalk is sometimes absent.

Lobed. With marginal indentations running $\frac{1}{3}$ to $\frac{2}{3}$ of the distance to the center or base, the segments usually somewhat rounded, as in Figs. 30, 169.

Longitudinal. Lengthwise, from base to apex.

Midrib. The central vein of a leaf, especially when more prominent than the other veins.

Milky. With an opaque, usually white, juice.

Needle-shaped. Long and slender, neither definitely flattened nor regularly tapering; may be long as in the Pine (Fig. 63), or short as in the Spruce (Fig. 80).

Node. The point on, or line around, a stem from which one or more leaves arise. Often not specially marked otherwise than that a leaf or leaf-scar is found there.

Notch. An angular indentation, as along the margins in Fig. 95.

Nut. A hard or bony fruit, like that of the walnut, oak, chestnut.

Nutlet. A small nut, or a small, hard, seed-like part of a fruit.

Oblong. Two or three times longer than broad, with the sides nearly parallel.

Once compound (leaf). With the leaflets attached to the primary axis of the leaf, as in Figs. 54*a*, 253.

Opposite (leaves). With two leaves at the same node, as in Fig. 2*a*.

Palmate, Palmately compound. With several leaflets

starting from a common point at the tip of the leaf-stalk, as in Fig. 253.

Papery (bark). Splitting into thin papery films, as in Fig. 132.

Petal. One of the parts of a flower, situated between the stamens and the calyx. The petals are usually the most conspicuous parts of the ordinary flower, generally being brightly colored, or white.

Pinnate, Pinnately compound. With several leaflets starting from different points along two sides of a common leaf-axis, as in Fig. 54*a*.

Pinnately veined. With numerous side veins branching somewhat regularly from both sides of a midrib, as in Fig. 178.

Pistil. The central organ, or one of the central organs, of a flower, in which the ovules (immature seeds) are produced.

Pith. The much softer central portion of a branch or branchlet.

Pod. A dry fruit which splits open naturally at maturity.

Pointed. With a definite point (blunt or acute), as in Figs. 21, 133.

Prickly. With small sharp-pointed hairs or spines.

Recurved. Curving backward or downward.

Rhombic. Of the general shape of a rhomb, as in Fig. 123.

Rounded (apex or base). Regularly curving, without notch or point, as the tips of the lobes and the apex of the leaf in Fig. 173.

Scale. A degenerate leaf. In a cone one of the somewhat flattened, usually woody, structures attached to the main axis.

Scale-like (leaf). A small and short leaf, the apex of which usually overlaps the base of the one next above it, like the scale of a fish, as in Fig. 5.

Scaly (bark). With flattish raised areas, especially when the edges are somewhat separated from the bark beneath, as in Fig. 170.

Shield-shaped. A somewhat circular or angular structure with its supporting stalk attached to one of the flat surfaces instead of to the edge.

Shoot. A stem and its leaves collectively considered.

Shreddy. With the edges of the scales or plates appearing as if frayed into shreds, as in Fig. 50.

Side veins. Veins branching from a midrib.

Simple (leaf). With only one blade, as in Figs. 47, 49, 173, 186.

Smooth. Neither rough nor hairy.

Spine. A sharp and slender stiff point.

Spiny. Having spines.

Stamens. The slender, usually stalked, structures surrounding the pistil of a flower. The box-like portion at the top is the anther in which the pollen is produced.

Stipules. Two small leaf-like bodies at the base of a leaf-stalk, as in Fig. 86. Commonly absent.

Symmetrical. Even-sided; one side essentially like the other, as in Fig. 146.

Taper-pointed. With a somewhat elongated point, especially when the margins below it are concave, as the apex of Fig. 84.

Teeth. Small projections along the margin, as in Fig. 100.

Terminal bud. A bud situated at the end of a stem or branch.

Thorn. A stiff woody sharp-pointed structure.

Toothed. Having small projections along the margin like the teeth of a saw, as in Fig. 100.

Top-shaped. A somewhat globular structure which tapers regularly to a narrow base, like an inverted geometrical cone.

Triangular. Of the general shape of a triangle, as in Fig. 127.

Trunk. The main stem of a tree, usually restricted to mean the part below the crown.

Twice compound. With leaflets attached to the secondary axes of the leaf (i. e., the main axis divides before it bears leaflets), as in Fig. 346.

Twig. A young shoot. Sometimes used with reference to the branchlet without the leaves.

Unsymmetrical. With the two sides unlike, as in Fig. 262.

Vein. One of the ribs or thickened lines in a leaf-blade.

Wavy. Alternately concave and convex along the margin, as in Fig. 46.

Wedge-shaped (leaf). Tapering regularly from a broad apex to a pointed base. A wedge-shaped base is pointed (often bluntly), with the margins straight or nearly so, like the sides of a wedge, as in Fig. 153.

Whorled. With three or more leaves around the stem at the same node, as in Fig. 1.

Wing. Any thin flat appendage attached to a thicker main structure.

Woolly. Covered with tangled or loosely matted hairs.

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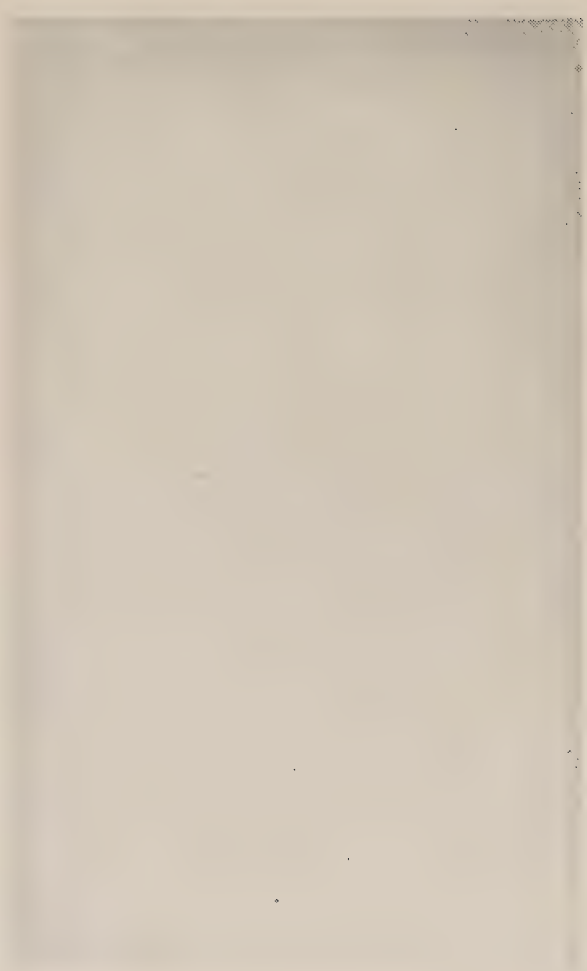

A SYSTEMATIC LIST OF TREES GROUPED IN FAMILIES, WITH PAGE REFERENCES

Native American trees in **bold face**. Foreign trees in roman. Scientific names in *italics*.

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1. Maiden-hair Tree, Ginkgo	*Ginkgo biloba* L.	11

PINE FAMILY	PINACEAE	
2. White Pine	*Pinus Strobus* L.	40
3. Loblolly Pine	*Pinus Taeda* L.	41, 42
4. Pitch Pine	*Pinus rigida* Mill.	41
5. Table Mountain Pine	*Pinus pungens* Lamb.	43
6. Jersey Pine	*Pinus virginiana* Mill.	43
7. Northern Scrub Pine	*Pinus Banksiana* Lamb.	43
8. Red Pine	*Pinus resinosa* Ait.	44
9. Austrian Pine	*Pinus Laricio* v. *austriaca* Endl.	45
10. Scotch Pine	*Pinus sylvestris* L.	44
11. Yellow Pine	*Pinus echinata* Mill.	40, 42
12. American Larch	*Larix laricina* (Du Roi) Koch.	45
13. European Larch	*Larix decidua* Mill.	46
14. Douglas Spruce	*Pseudotsuga taxifolia* Britt.	10
15. Colorado Blue Spruce	*Picea Menziesii* Engelm.	48
16. White Spruce	*Picea canadensis* (Mill.) BSP	49
17. Red Spruce	*Picea rubra* (Du Roi) Dietr.	47
18. Black Spruce	*Picea mariana* (Mill.) BSP	47
19. Norway Spruce	*Picea Abies* (L.) Karst	46, 48

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20. Oriental Spruce	*Picea orientalis* Carr.	48
21. **Balsam Fir**	*Abies balsamea* (L.)Mill.	9
22. **Hemlock**	*Tsuga canadensis* (L.) Carr.	7
23. **Bald Cypress**	*Taxodium distichum* (L) Richard	9
24. **Coast White Cedar**	*Chamaecyparis thyoides* (L.) BSP.	6
25. **Arbor Vitae**	*Thuja occidentalis* L.	5
26. Common Juniper	*Juniperus communis* L.	2, 6
27. **Dwarf Juniper**	*Juniperus communis* v. *depressa* Pursh.	2, 6
28. **Red Cedar**	*Juniperus virginiana* L.	4, 5
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29. **Black Willow**	*Salix nigra* Marsh.	51
30. **Ward's Willow**	*Salix Wardi* Bebb.	51
31. **Peach-leaved Willow**	*Salix amygdaloides* Anders.	50
32. Bay-leaved Willow	*Salix pentandra* L.	50
33. Crack Willow	*Salix fragilis* L.	52
34. White Willow	*Salix alba* L.	53
35. Yellow Willow	*Salix alba* v. *vitellina* (L). Koch.	53
36. Blue Willow	*Salix alba* v. *caerulea* (Sm.) Koch.	53
37. Weeping Willow	*Salix babylonica* L.	52
38. White Poplar	*Populus alba* L.	53
39. **American Aspen**	*Populus tremuloides* Michx.	55
40. **Large-toothed Aspen**	*Populus grandidentata* Michx.	54
41. **Downy Poplar**	*Populus heterophylla* L.	58
42. **Balsam Poplar**	*Populus balsamifera* L.	57
43. Balm of Gilead	*Populus candicans* Ait.	58
44. **Carolina Poplar**	*Populus deltoides* Marsh.	56
45. Black Poplar	*Populus nigra* L.	57
46. Lombardy Poplar	*Populus nigra* v. *italica* Du Roi	56

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47. Butternut	*Juglans cinerea* L.	60
48. Black Walnut	*Juglans nigra* L.	60
49. Shag-bark Hickory	*Carya ovata* (Mill.) K. Koch.	62
50. Big Shell-bark	*Carya laciniosa* (Michx. f.) Loud.	68
51. Mockernut	*Carya alba* (L.) K. Koch.	67
52. Small-fruited Hickory	*Carya microcarpa* Nutt.	65
53. Pignut	*Carya glabra* (Mill.) Spach.	65
54. Bitternut	*Carya cordiformis* (Wang.) K. Koch.	67

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56. American Hornbeam	*Carpinus caroliniana* Walt.	29
57. Black Birch	*Betula lenta* L.	69
58. Yellow Birch	*Betula lutea* Michx. f.	71
59. River Birch, Red Birch	*Betula nigra* L.	73
60. Gray Birch	*Betula populifolia* Marsh.	73
61. White Birch, Blue Birch	*Betula pendula* Roth.	74
62. Cut-leaved Birch	*Betula pendula* v. *dalecarlica* L.	73
63. European Paper Birch	*Betula alba* L.	75
64. Weeping Birch	*Betula alba* v. *pendula* Hort.	74
65. American Canoe Birch	*Betula alba* v. *papyrifera* (Marsh) Spach.	76
66. Cordate-leaved Birch	*Betula alba* v. *cordifolia* (Regel) Fernald	75
67. Downy Green Alder	*Alnus mollis* Fernald	76
68. Speckled Alder	*Alnus incana* (L.) Muench	77
69. Smooth Alder	*Alnus rugosa* (Du Roi) Spreng.	78
70. European Black Alder	*Alnus vulgaris* Hill	78

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71. Sea-side Alder	*Alnus maritima* (Marsh.) Muhl.	77
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72. American Beech	*Fagus grandifolia* Ehrh.	80
73. European Beech	*Fagus sylvatica* L.	80
74. Purple-leaved Beech	*Fagus sylvatica* v. *purpurea* Ait.	79
75. Fern-leaved Beech	*Fagus sylvatica* v. *heterophylla* Loud.	79
76. American Chestnut	*Castanea dentata* (Marsh.) Borkh.	81
77. European Chestnut	*Castanea sativa* Mill.	82
78. Chinquapin	*Castanea pumila* (L.) Mill.	81
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83. Bur Oak, Mossy-cup Oak	*Quercus macrocarpa* Michx.	94
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85. Cow Oak	*Quercus Michauxii* Nutt.	89
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91. Scarlet Oak	*Quercus coccinea* Muench.	85
92. Black Oak	*Quercus velutina* Lam.	85
93. Spanish Oak	*Quercus falcata* Michx.	87
94. Scrub Oak	*Quercus ilicifolia* Wang.	87
95. Water Oak	*Quercus nigra* L.	83
96. Black Jack Oak	*Quercus marilandica* Muench.	88, 93
97. Laurel Oak	*Quercus imbricaria* Michx.	83

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100. English Elm	*Ulmus campestris* L.	99
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110. Cucumber Tree	*Magnolia acuminata* L.	103
111. Great-leaved Magnolia	*Magnolia macrophylla* Michx.	103
112. Umbrella Tree	*Magnolia tripetala* L.	102
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120. Siberian Crab	*Pyrus baccata* L.	105
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